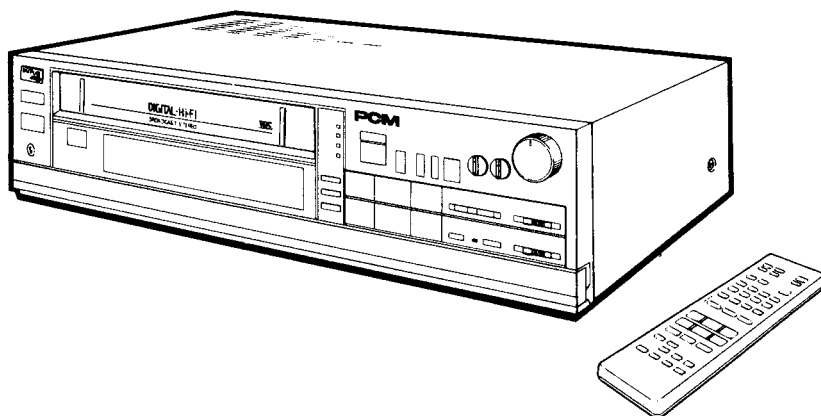


TOSHIBA

COLOR VIDEO CASSETTE RECORDER

DX-900, DX-900C



SPECIFICATIONS

GENERAL

Video recording system: Rotary 2-head helical scanning
Head configuration: 6-head rotary
(Dedicated heads for SP & EP)
Video signal: EIA standard NTSC color
Storage temperature: -20°C to $+60^{\circ}\text{C}$ (-4° to $+140^{\circ}\text{F}$)
Operating temperature: 5° to 40°C (41° to 104°F)
Antenna: 75-ohms external antenna terminal for VHF
300-ohms external antenna terminal for UHF
Channel coverage: VHF channels 2 — 13
UHF channels 14 — 83
CATV channels A — W, AA — ZZ,
AAA — CCC, A₁ — A₈
VHF output signal: Channel 3 or 4 (selectable)
66 dB μ , 75 ohms unbalanced
Power consumption: 38W
Weight: 22.9 lbs. (10.4 kg)
Dimensions: 16-15/16 x 4-1/2 x 15-1/4 inches (W.H.D)
(430 x 115 x 388mm) (W.H.D)

VIDEO

Input: VIDEO LINE IN:
Phono jack, 1.0V (p-p), 75-ohms,
unbalanced, sync, negative
Output: VIDEO LINE OUT:
Phono jack, 1.0V (p-p), 75-ohms,
unbalanced, sync, negative
Signal-to-noise ratio: [SP]: Better than 45 dB

AUDIO

Input: AUDIO LINE IN:
Phono jack, 47 k-ohms, -8 dBs,
unbalanced
Output: AUDIO LINE OUT:
Phono jack, less than 10 k-ohms,
 -6 dBs, unbalanced

	PCM	Hi-Fi
Frequency Characteristics	5 Hz — 20 kHz	20 Hz — 20 kHz
Dynamic Range	More than 86 dB	More than 90 dB
Distortion	Less than 0.007%	Less than 0.3%

TAPE TRANSPORT

Tape speed: SP 33.35 mm/sec., LP 16.67 mm/sec.,
EP 11.12 mm/sec.
Maximum recording time: 480 min. with T-160 tape (EP mode)
Fast forward time: Within 6.0 min. (T-120)
Rewind time: Within 6.0 min. (T-120)

TIMER

Fluorescent digital display
Count down from AC-line frequency

Remote Control Unit

37 keys: 42 modes.
(with direct channel select)
Infrared Remote Control Operation

Caution: The unauthorized recording of television programmes
and other materials may infringe on the rights of others.

Design and specifications are subject to change without notice.

SAFETY NOTICE

SAFETY PRECAUTIONS

LEAKAGE CURRENT CHECK

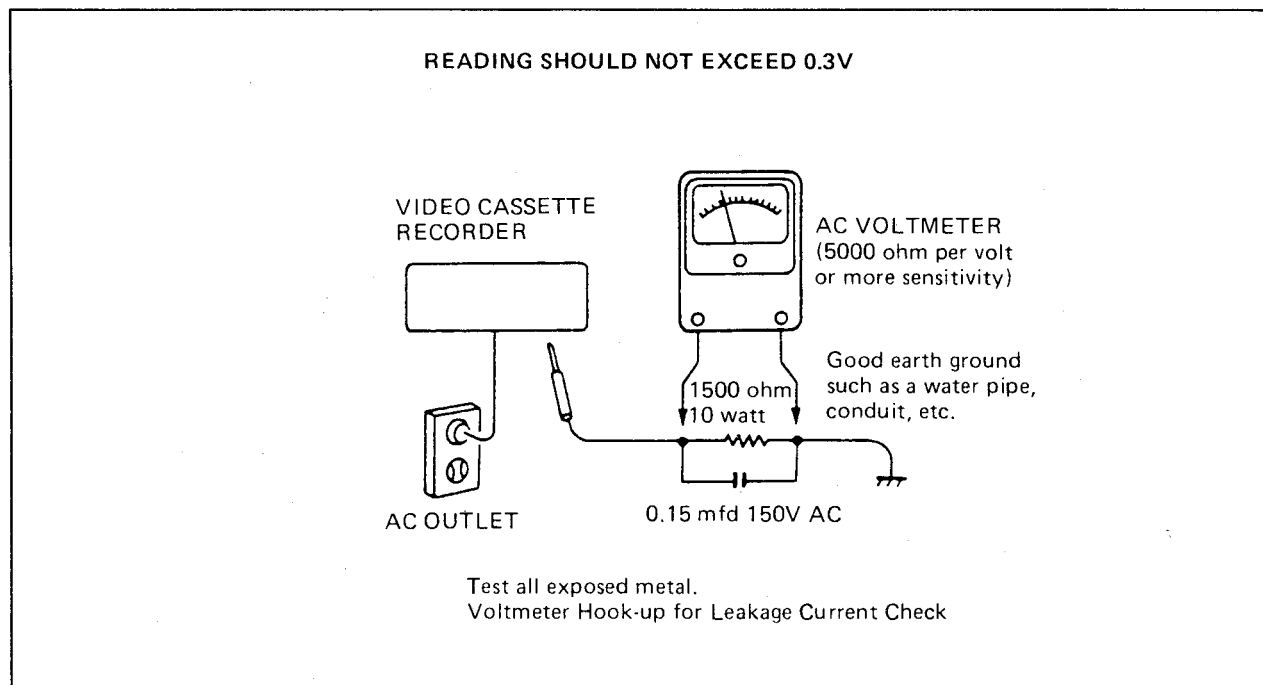
Plug the AC line cord directly into a 120V AC outlet (do not use an isolation transformer for this check). Use an AC voltmeter, having 5000 ohms per volt or more sensitivity.

Connect a 1500 ohm 10 watt resistor, paralleled by a 0.15 mfd 150V AC capacitor between a known good earth ground (water pipe, conduit, etc.) and all exposed metal parts of cabinet (antennas, handle bracket, metal cabinet, screwheads, metal overlays, control shafts, etc.).

Measure the AC voltage across the 1500 ohm resistor. The test must be conducted with the AC switch on and then repeated with the AC switch off. The AC voltage indicated by the meter may not exceed 0.3 volts. A reading exceeding 0.3 volts indicates that a dangerous potential exists, the fault must be located and corrected.

Repeat the above test with the VCR power plug reversed.

NEVER RETURN A VCR TO THE CUSTOMER WITHOUT TAKING NECESSARY CORRECTIVE ACTION.



The lightning flash with arrowhead symbol, within an equilateral triangle, is intended to alert the user to the presence of uninsulated "dangerous voltage" within the product's enclosure that may be of sufficient magnitude to constitute a risk of electric shock to persons.



The exclamation point within an equilateral triangle is intended to alert the user to the presence of important operating and maintenance (servicing) instructions in the literature accompanying the appliance.

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SECTION 1

GENERAL DESCRIPTION

OPERATING INSTRUCTIONS

Features

The TOSHIBA DX-900 is designed with a number of special features for your added enjoyment, including PCM recording and playback, digital graphic timer, multi digital playback, digital still and slow playback, TV still, and Hi-Fi recording system.

Other Special Features:

140 Channel Cable Compatible FS (Frequency Synthesized) Tuner

This FS tuner automatically selects with utmost accuracy all receivable channels without discriminating between UHF, VHF and CATV channels. During the automatic search the sound is muted.

14-Day, 4-Program Programmable Timer

With this handy function you can program your VCR to make up to four different kinds of unattended recording in a two-week period.

Auto-Rewind

All tapes are rewound automatically when the tape reaches its end during recording or playback.

Digital Still and Slow Playback

This function enables various kinds of visual playback with easy-to-use buttons aided by a digital memory circuit in both SP and EP modes. You can enjoy immediate still playback free of flicker and noise; smooth digital slow playback (at 1/4 the normal speed); and noise-free reverse slow playback (at 1/4 the normal speed).

Digital Double-Speed Playback

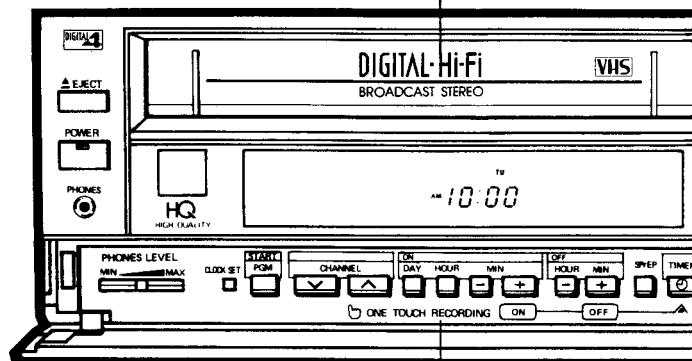
This function gives twice the normal speed playback with sound.

Multi Digital Playback

Three functions - multi still, multi memo and multi series - are provided to divide the screen into four parts by using the remote controls.

Auto Power On and Fully-Automatic Play

When a cassette is loaded, the power goes on automatically. When a pre-recorded tape (without safety tab) is loaded into the unit, not only does the power go on, but the Fully-Automatic Play function guides the tape through playback and rewind automatically. When the tape has been played and rewound, it is also ejected and the power turned off without you having to lift a finger.



One Touch Timer Recording

This convenient function lets you program the VCR in a matter of seconds for unattended recording of TV programs starting either immediately or within twenty-four hours. It was especially designed for persons "on the go".

Digital Audio Recording and Playback

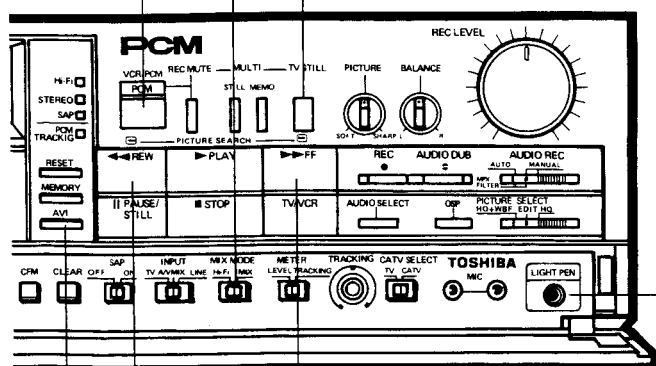
This VCR enables high quality digital audio recording and playback by using a built-in PCM (pulse code modulation) processor. The PCM changes audio analog signals into pulsed digital signals and then reconverts to analog signals, to get a sound close to the original in recording and playback. Since the PCM recording terminal is equipped independently, recording can be done independently of Hi-Fi recording.

Hi-Fi Recording and Playback

This function creates a sound quality similar to that of digitally-recorded sound. It gives a wide dynamic range and creates less noise and distortion because sound is recorded in FM.

Digital TV Still

This function enables still frame during a broadcast TV program. The sound continues even during the still frame, so that it is possible to know what is happening in the program.



Digital Graphic Timer

The optical fiber and digital technologies enable information necessary to timer reservation to be displayed on the TV screen in easy-to-see color graphics. A light pen which uses an optical fiber enables easy timer reservation by simply touching it to the CRT following the display on the screen. The reservation can also be checked by using the graphic display on the TV screen.

Two-Way Picture Search

This function lets you speed up playback both forwards and in reverse at 5 times or 15 times (EP speed only) the normal playback speed in order to quickly locate a certain section on the tape you are watching.

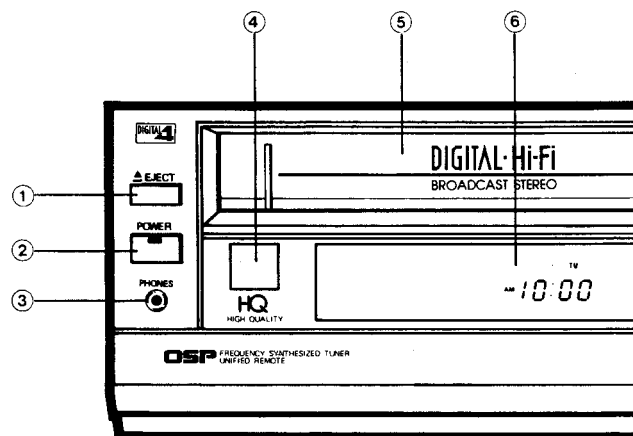
AVI (Automatic Visual Index) Function

This convenient function enables quick location of the desired scene or number. It automatically inserts the AVI signal on the tape at the beginning of each sequence in recording; when the AVI button is pressed in the fast-forward or rewind mode in reproduction, the tape can be advanced to the beginning of each required and reproduce the searched sequence for about 5 seconds. If the desired picture is not found during the first the 5 seconds, the tape resumes the next fast-forward or rewind movement automatically. The tape repeats this until the PLAY button is pressed to reproduce the desired picture.

Location of Controls

(Front Panel)

- ① **EJECT Button**
Used to eject a tape from the cassette compartment.
- ② **POWER Button**
Used to turn the VCR on when it is plugged in. Note that the power goes on automatically (Auto Power On) when a tape is loaded into the cassette compartment.
- ③ **PHONES (Headphones) jack**
For connection of headphones for monitoring the sound during audio dubbing or for private listening.
- ④ **Infrared Remote Control Receiver**
Picks up infrared light commands from the remote control.
- ⑤ **Cassette Compartment**
Note that the power goes on automatically when a cassette is inserted in the compartment. If a pre-recorded cassette without the safety tab is inserted, the Fully-Automatic Play function is activated.
- ⑥ **Multi Display**
Displays all types of information to guide you in operating this VCR.
- ⑦ **AVI (Automatic Visual Index) Button**
Used to activate the AVI function. "S" appears in the multifunction display.
- ⑧ **MEMORY Button**
Used in the Rewind or Fast Forward mode to stop the tape automatically at about 0000 on the counter.
- ⑨ **RESET Button**
Used to reset the counter to 0000.
- ⑩ **SAP Indicator**
Lights when a SAP program is being received.
- ⑪ **STEREO Indicator**
Lights when a stereophonic program is being received.



- ⑲ **PICTURE Sharpness Control**
Used to adjust for softer or sharper pictures, as desired, during recording and playback.
- ⑳ **BALANCE Control**
Used to adjust the balance of the recording level between left and right during Hi-Fi recording in MANUAL or PCM recording.
- ㉑ **REC LEVEL Control**
Used to control adjust the recording level during Hi-Fi recording in MANUAL or PCM recording.
- ㉒ **AUDIO REC Select Switch**
By setting this switch to AUTO, the Hi-Fi recording level will be automatically set to the appropriate level. For manual adjustment set the switch to MANUAL.
- ㉓ **PICTURE SELECT Switch (HQ + WBF/EDIT/HQ)**
HQ + WBF: When recording in this position, enabling a distinct picture for recording and playback. We recommend this position for recording.
EDIT: Set in this position when copying.
HQ: For recording in areas where the broadcast is weak, this position may improve picture quality. Also, when snow occurs during playback set to this position.
- ㉔ **OSP Button**
Used to operate the Digital Graphic Timer.
- ㉕ **AUDIO DUB Button**
Used to dub audio only into a pre-recorded tape.
- ㉖ **AUDIO SELECT Button**
Used to select one of the audio output modes.
- ㉗ **REC Button**
Used to begin recording a program.
- ㉘ **TV/VCR Button**
Used to select the VCR tuner or the TV tuner for reception. The setting you have chosen will appear in the form of the letters VCR either lighting up or going off on the multidisplay. When set to TV (not lit) you can watch normal TV programs or watch one TV program on the TV while recording another program with the VCR. When set to VCR (VCR lamp is lit), you can watch the program being recorded.

⑫ **Hi-Fi Indicator**
Lights while recording or playing back a recorded tape on a Hi-Fi system.

⑬ **PCM TRACKING Indicator**
Indicates whether the signal has dropped out when playing back PCM-recorded tape, by lighting, blinking or not being lit.

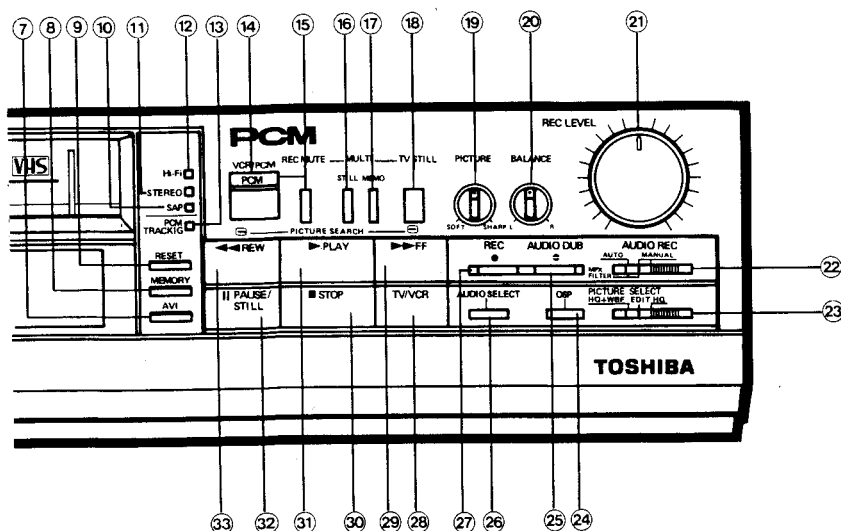
⑭ **VCR/PCM Selector**
Select either the PCM mode for PCM (Pulse Code Modulation) recording and playback or the VCR mode for normal recording and playback. The PCM indicator lights when set to the PCM mode, and goes off when set to the VCR mode.

⑮ **REC MUTE Button**
Used during PCM recording to create a silent segment on the tape when, for example, you wish to cut out unnecessary commercials or narrations.

⑯ **MULTI STILL Button**
Used to operate the Multi Still function, one of the special Multi Digital Play features.

⑰ **MULTI MEMO Button**
Used to operate the Multi Memo function, one of the special Multi Digital Play features.

⑱ **TV STILL Button**
Used to still the picture when viewing a TV program.



⑲ **FF Button**
Used to advance the tape at high speed when the VCR is in the STOP mode. While fast-forwarding there will be no picture or sound from the pre-recorded tape. This button is also pressed during playing mode to access Forward Picturer Search.

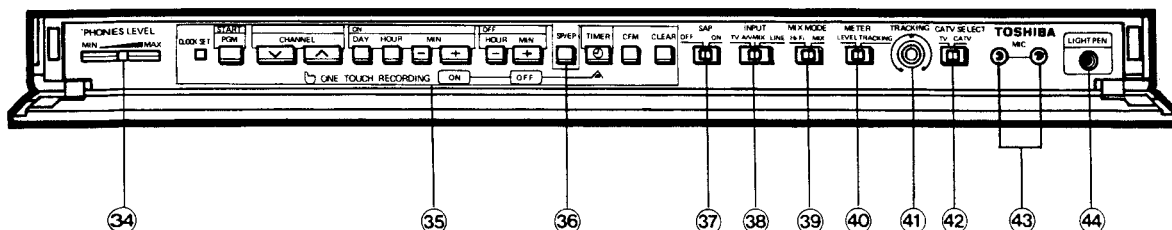
⑳ **STOP Button**
Used to stop a tape during recording and playback. If the button is pressed during Fully-Automatic Play, the function will be cancelled.

㉑ **PLAY Button**
Used to begin playing back a tape.

㉒ **PAUSE/STILL Button**
Used during recording to edit out unwanted material. It is also used during playback to partially freeze a certain frame and for Frame Feeding.

㉓ **REW Button**
Used to rewind the tape at high speed when the VCR is in the STOP mode. During rewinding there will be no picture or sound from the pre-recorded tape. This button is also pressed during play mode to access Reverse Picturer Search.

Behind The Door



34 PHONE (Headphones) LEVEL Controls

Used to adjust the volume heard through the headphones.

35 Multifunctional Buttons

These buttons are used for a number of different operations. Detailed explanations of their uses are given on the following page.

36 SP/EP Tape Speed Selector

This button is used to select a tape speed to record at (SP: Standard Play or EP: Extended Play) depending on your preferences at the moment. The EP mode gives you more footage on your tape, while the SP mode gives you best quality recordings.

37 SAP Switch

SAP (Second Audio Program) permits reception of Multi-plex broadcast. When SAP signal is received, the SAP indicator lights up. If SAP is desired, set the SAP switch to ON".

38 INPUT Selector Switch (TV.A/V MIX.LINE)

In this VCR, signals being recorded are selected using the INPUT Selector Switch. (Described below)

39 MIX MODE Selector Switch

Set this switch to "Hi-Fi" to listen to Hi-Fi sound only, and to "MIX" to mix Hi-Fi and monophonic sound.

40 METER Selector Switch

The METER Selector Switch is used to monitor/adjust the audio level when set to LEVEL or Hi-Fi Tracking Control when set to TRACK.

41 TRACKING Control

This control is adjusted when you want to eliminate noise from your picture or Hi-Fi audio during playback.

42 TV/CATV Selector Switch

If a cable system is used, leave it in CATV position.




43 MICROPHONE Jacks

Used to connect the microphone for live recording and after-recording.

44 LIGHT PEN Jack

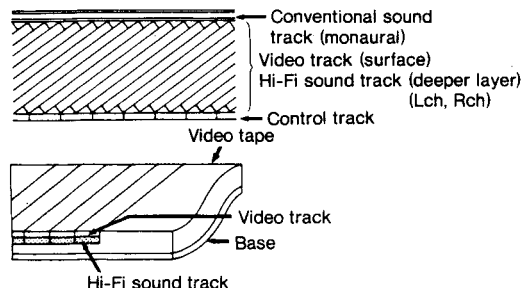
Used to connect the lightpen when using the Digital Graphic Timer function.

Signals that can be recorded

Position	Video Track	Sound Track		
		Conventional sound Track	AUDIO Hi-Fi Track	
			L	R
	Records video signals from VCR Tuner	Records sound from VCR Tuner (MONO)	SAP ON TV L	SAP
			SAP OFF TV L	TV R
	Records video signals from VCR Tuner	Records sound from VCR Tuner (MONO)	Records sound from audio input terminal L	— R
	Records video signals from video input terminal	Records sound from audio input terminal	Records sound from audio input terminal L	— R

This is a VHS Hi-Fi VCR with special Hi-Fi sound heads, which record sound signals a layer below the video tracks.

The Hi-Fi sound track is set in stereo format as shown in the diagram below.



Specification of Hi-Fi Recording

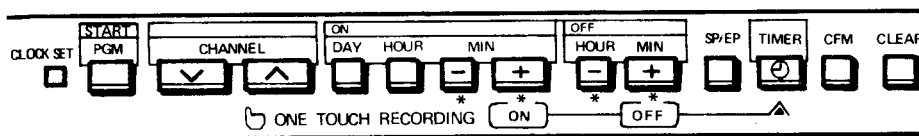
Dynamic Range : More than 90 dB

Wow & Flutter : Less than 0.005%

Frequency Response : From 20 Hz to 20 kHz

Multifunctional Buttons

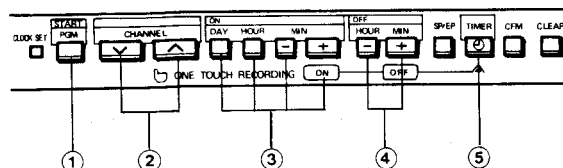
As mentioned in the previous section, one of the special features of the new and simplified DX-900 is that some of its controls are multifunctional. This means that one button has two or more functions, depending on the operation being performed. This is especially so for the controls on the right half of the control panel. Although this may seem somewhat complicated at first, once you become familiar with the various operations it will be apparent that this is a truly economical and easy-to-use system.



* The asterisk * means that this is a multifunctional button.

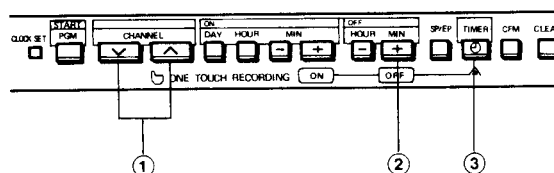
These multi-function buttons are used in the following operations. See the specific sections for more detailed explanations of each button's uses.

PROGRAMMABLE TIMER FUNCTION



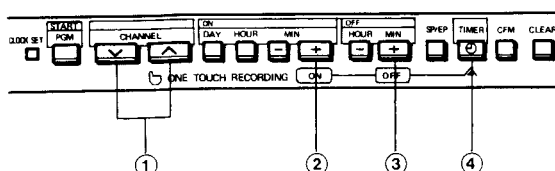
- 1 PGM/START Button
- 2 CHANNEL Select Buttons
- 3 DAY/HOUR/MIN -/+ Buttons (timer start)
- 4 HOUR/MIN Buttons (timer end)
- 5 TIMER Button

OTR FUNCTION I



- (Immediate recording)
- 1 CHANNEL Select Buttons
 - 2 OTR OFF Button
 - 3 TIMER Button

OTR FUNCTION II

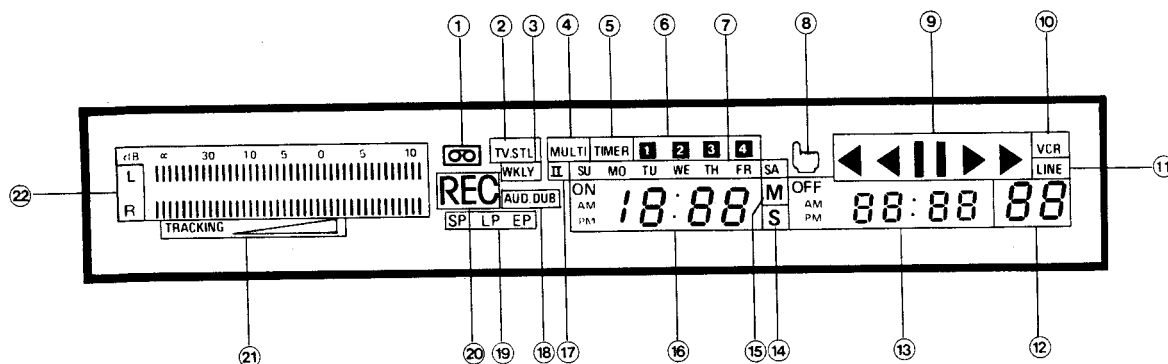


- (within 24 hours)
- 1 CHANNEL Select Buttons
 - 2 OTR ON Button
 - 3 OTR OFF Button
 - 4 TIMER Button

Multidisplay

MULTIDISPLAY

This easy-to-read multiple function display gives various information concerning VCR functions. Only a general description of each function is given here for reference.



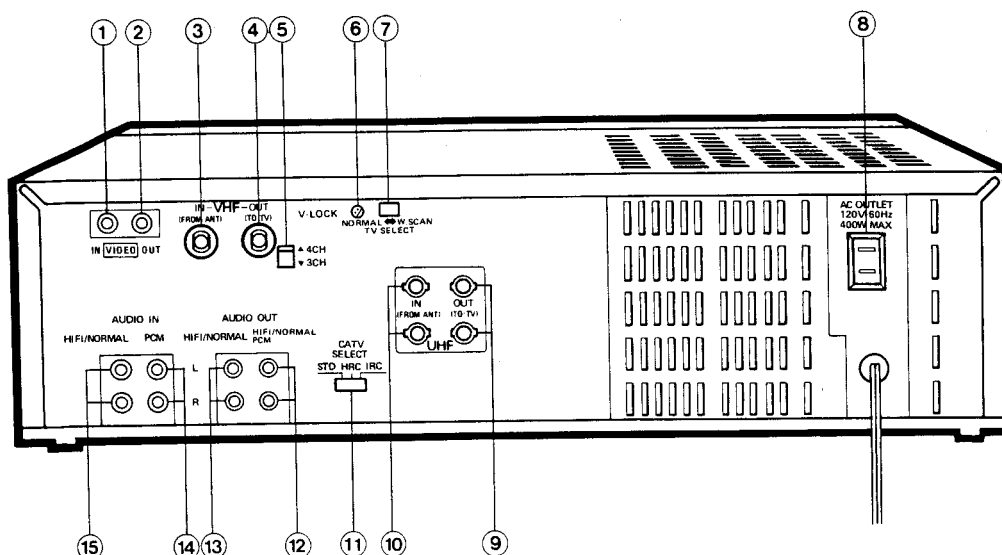
- ① **Cassette Indicator**
Lights when a cassette is loaded, even when the power is off. The indicator flashes when a tape is being inserted or ejected.
- ② **TV Still Indicator**
Lights up when you are using the TV STILL function.
- ③ **Weekly Indicator "WKLY"**
Lights when the Programmable Timer is being set to record programs in succession by week.
- ④ **MULTI Indicator**
Lights when the Multi Digital Play function is in use.
- ⑤ **Timer Indicator**
Lights when the TIMER button has been pressed to set the Programmable Timer recording cycle or to set recording in the One-Touch Timer-mode.
- ⑥ **Program and Multi Frame Number Indicator**
Displays the program number when the Programmable Timer is set, and the still and memory frame number when in the Multi Still mode.
- ⑦ **Day Display**
Indicates the day of the week set by the VCR clock for the present time or for timer programming.
- ⑧ **OTR Indicator**
Lights up when programming the One-Touch Timer.
- ⑨ **Multifunctional Mode Indicator**
- ⑩ **VCR Indicator**
Lights when the TV/VCR button on the control panel is pressed. This indicator lights when viewing a program while it is being recorded, or watching TV through the VCR tuner. It is off when watching a normal TV program (not recording) or when watching one program while recording another.
- ⑪ **LINE Indicator**
Lights when the INPUT Selector switch is in the LINE position.
- ⑫ **CHANNEL Indicator**
Indicates the number of the channel which is currently being watched or recorded.
- ⑬ **Multifunctional**
Tape counter display programmable Timer OFF time/OTR END time.
- ⑭ **Visual Index Indicator**
Lights when in the Automatic Visual Index Search mode.
- ⑮ **Counter Memory Indicator**
Lights when the COUNTER MEMORY button is pressed to program the tape counter.
- ⑯ **Multifunctional**
Clock/Programmable Timer Start time/OTR Start time display.
- ⑰ **Second Week Indicator "II"**
Lights when setting the Programmable Timer to record a program in the second week.
- ⑱ **Audio Dub Indicator**
Lights when the Audio Dub function is being controlled for dubbing.
- ⑲ **Tape Speed Indicator**
Tape speed is indicated (SP/LP/EP).
- ⑳ **Mode Indicator**
The [REC] indicator lights when this VCR is in REC mode (for recording).
- ㉑ **TRACKING Indicator**
Lights when the METER Selector switch is set to TRACKING.
- ㉒ **Audio Select Indicator**
Changes according to the selected audio output mode. The L and R indicators are for the Stereo mode.

▶ Playback/Recording	⏸ Still/Pause	▶▶ FF/Forward Picture Search
◀◀ REW/Reverse Picture Search	◀ Reverse slow motion	⏪ Slow motion

NOTES

Multifunctional indicators serve a number of purposes. Different symbols appear in the same place according to the buttons you press. This will become clearer as you actually begin using the DX-900.

Rear Panel



① Video IN Jack

Connect this jack to the VIDEO output jack for recording from an external video source such as VCR, VCR or TV set equipped with this jack.

② Video OUT Jack

Connect this jack to the VIDEO input on a VCR, VCR or TV set with the jack for external recording or monitoring.

③ VHF IN Terminal

This terminal is connected from a VHF antenna for VHF reception or a cable TV line.

④ VHF OUT Terminal

This terminal is connected to your TV set's VHF IN terminal.

⑤ Output Channel Selector Switch

This switch is set to either 3CH or 4CH according to the channel left vacant in your area, so that signals received by the VCR can be converted into signals suitable to your TV for viewing through an unused channel (either 3 or 4).

⑥ V-LOCK Adjustment

If the picture is vertically unstable during STILL mode, adjust with this control.

⑦ TV SELECT Switch

Switches between normal TV and Double Scan TV. Set to the Double Scan position, if your TV is a Double Scan TV.

⑧ AC Outlet

AC power (120 VAC, 60 Hz, 400 W max.) is supplied through this outlet. Power is supplied when the power cord is plugged in even if the power switch is off.

⑨ UHF OUT Terminals

These terminals are connected to your TV set's UHF IN terminals.

⑩ UHF IN Terminals

These terminals are connected to a UHF antenna for UHF reception.

⑪ CATV MODE SELECTOR Switch (STD/HRC/IRC)

Set to the desired position depending on your cable system.

⑫ Audio (Hi-Fi/Normal/PCM) OUT Jack

Audio of a Hi-Fi audio track and normal audio track is transmitted from this jack. Audio of a PCM recording can be transmitted from this jack by setting the VCR/PCM Selector on the front panel to PCM.

⑬ Audio (Hi-Fi/Normal) OUT Jack

Connect this jack to the AUDIO input on an external audio source for playing or recording.

⑭ Audio (PCM) IN Jack

To make a PCM recording, hook up an external audio source such as audio equipment to this jack. Audio received through this jack is recorded in PCM mode.

⑮ Audio (Hi-Fi/Normal) IN Jack

Connect this jack to the AUDIO output jack for recording from an external audio source such as another VCR, VCR, receiver or TV set equipped with this jack.

Remote Control

This section shows the locations of the buttons and their functions.

This DX-900 remote control can operate both the VCR and the TV. The upper buttons are used for the TV, and the lower buttons for the VCR. It also operates special functions such as Multi Digital Playback which are not handled on the VCR main unit.

TV Operating part

① CHANNEL Select Buttons

Used to select TV channels.

② Volume Adjustment Buttons

Used to adjust the TV volume.

③ TV POWER Button

Used to turn the TV power on or off.

④ TV/VIDEO Button

Used to select the VCR or TV.

Notes 1. Not applicable to Toshiba TVs whose remote controllers are CT-907, 910, 913, 917, 918, 924, 932, 934, 944, 950, 951, and 951A.

2. The TV/VIDEO button cannot be used for TVs not having a TV/VIDEO switching function.

VCR Operating Part

⑤ TV/VCR Button

Used to select the VCR tuner or TV tuner for TV viewing and various recording options.

⑥ TV STILL Button

Used to still the picture when viewing a TV program.

⑦ CHANNEL Select Buttons

Used to select a channel directly. Press two keys such as 02, 03, ... or 09 when a channel from 2 to 9 is selected. The UP (▲) button is used for selection in the upper direction, and the DOWN (▼) button is for the lower direction.

Note:

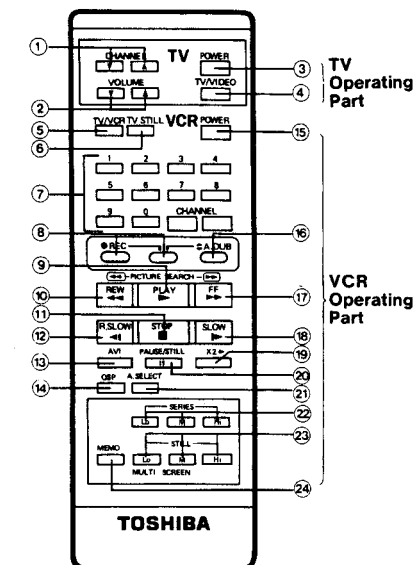
When a channel is selected by one key such as 2, 3, ..., or 9, check that the channel indicator of the VCR display goes from **2** to **2** after two seconds.

⑧ REC Buttons

Press these buttons simultaneously to start recording on the tape loaded.

⑨ PLAY Button

Used to activate the Playback mode as well as special effects in playback operation.



⑩ REW Button

Used to rewind the tape at high speed and reverse the picture for searching a section.

⑪ STOP Button

Used to stop the VCR in any mode. Note that pressing this button will cancel the Fully-Automatic Play function.

⑫ REVERSE SLOW MOTION Button

Used during playback for reverse slow motion at 1/4 the normal speed.

⑬ AVI Button

Used to operate the Automatic Visual Index function. The tape stops in the beginning of the program automatically during fast forward or

ward or rewind if this button has been pressed; then the program is played for approx. 5 seconds, and then fast forward or rewind is recovered to search for the beginning of the next program. The AVI signal is recorded by pressing the AVI button during recording.

⑭ OSP Button

Used to select the Timer Screen mode, when the timer reservation is validated.

⑮ POWER Button

Used to turn the VCR power on or off.

⑯ Audio Dubbing Buttons

Used when after-recording to add sound to the tape when recording is finished. Press these buttons simultaneously to start dubbing on the recorded tape.

⑰ FF Button

Used to forward the tape at high speed and forward the picture for searching a section.

⑱ SLOW Motion Button

Used during playback for forward slow motion at 1/4 the normal speed.

⑲ Digital Double-Speed Playback Button

Used to play back the picture at twice the normal speed.

⑳ PAUSE/STILL Button

Used during recording as well as for various special effects in playback operation.

㉑ AUDIO SELECT Button

Used to select the sound.

㉒ MULTI SERIES SPEED SELECT Buttons

Used to change the Multi Series operation speed.

㉓ MULTI STILL SPEED SELECT Buttons

Used to change the Multi Still operation speed.

㉔ MULTI MEMO Button

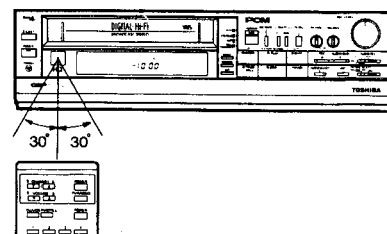
Used to operate the Multi Memo function.

NOTES

- The remote control **cannot be used** to set the **Programmable Timer**, or during timer operation.
- Press remote control buttons at **intervals of at least 1 second** each for correct operation.
- Keep the unit **away from heat and humidity** and sources of **electrical shock**, and take the batteries out when not using it for a long period of time to safeguard against corrosion.

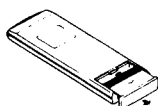
Remote Control Operation Range

1. Any object between the remote control and VCR will block the path of the beam when it is being used. Dark walls, direct sunshine or very bright (incandescent) light will reduce the remote control sensitivity.
2. Hold the remote control within an angle range of about 30° from either side of the VCR receptor center as shown.
3. When the remote control is vertical to the VCR receptor, it will work within about 23 feet (7 m) from the VCR.
4. Point the front of the remote control directly at the front of the VCR.

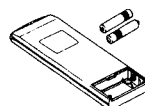


Battery Installation

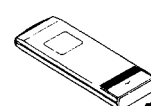
How to install batteries into the Remote Control Unit:



Remove the battery cover on the reverse side of the unit.



Install 2 batteries ("AAA" size) into the unit.



Close the battery cover.

Note: Carefully install batteries to match the polarity diagrams.

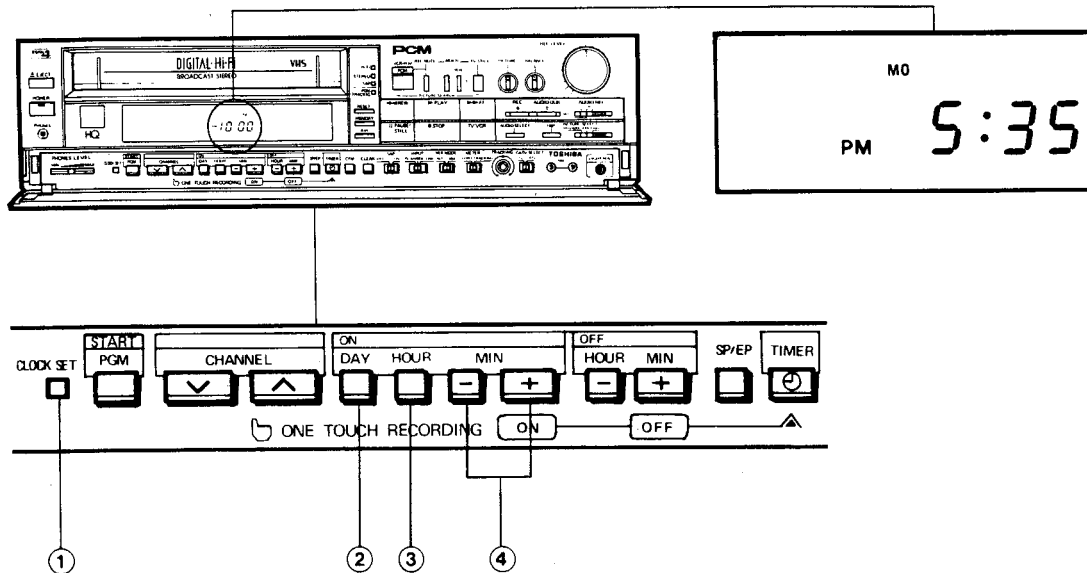
Setting the VCR Clock

The VCR clock can be set when basic installation connections have been made (to TV and antenna) and the VCR has been plugged in. The clock not only serves as a digital display of your current local time, but is essential to the successful operation of the VCR's Programmable Timer used for unattended recording. Therefore it is of utmost importance that the clock be set accurately. The clock display will flash "SU. MO ... SA AM 12:00" when the VCR is plugged in. The clock will work as long as the cord is plugged in, regardless of whether the VCR power is on or off. The clock display brightness will automatically darken from 10 PM to 5.59 AM.

The following example shows you how to set the clock.

Example: Setting the clock to the imaginary present day and time. Monday 5:35 pm.

The light pen can also be used to set the time on the TV screen.



1	2	3	4	5
Press the CLOCK SET button ①.	Set the day of the week, by pressing the DAY button ②.	Set the hour, by pressing the HOUR button ③.	Set the minutes by pressing the MIN buttons ④ to add and subtract minutes.	Press the CLOCK SET button ①.
CLOCK SET 	MO	MO PM 5	MO PM 5:35	CLOCK SET
				The clock will start operating at 5.35 pm.

NOTES

Power Failure

- When the VCR's back-up time is exceeded during a power failure the entire clock display will flash on and off. When this happens reset the clock to the correct present time according to the above steps.
- When the colon in the clock display is flashing, this means that there has been a power failure within the time allowed by the back-up reserve. Reset the clock to the correct present time.

Operating the FS Tuner

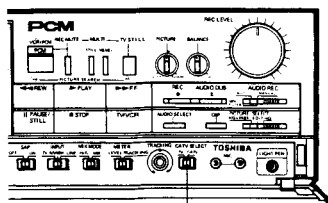
This VCR has the FS (Frequency Synthesized) tuner and is designed to receive the following TV signals:

1. Broadcast TV signals.
 2. STD (standard) Cable TV signals.
 3. HRC (Harmonic Related Carriers) Cable TV signals.
 4. IRC (Incremental Related Carriers) Cable TV signals.
- IRC is also called ICC (Incremental Coherent Carriers).

For each of these systems, exact frequencies are developed within your VCR set assuring precise tuning. For proper tuning operation, the CATV Mode Selector switch mentioned below must be set correctly to match your cable TV system. When you connect to a cable TV system, it is recommended that you consult with your local cable company to check if your system is STD, HRC or IRC.

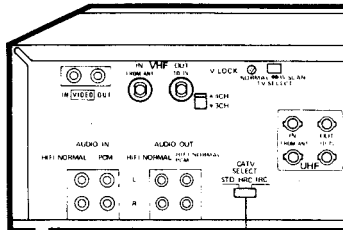
Controls Used for Operating the FS Tuner

(Front Panel)

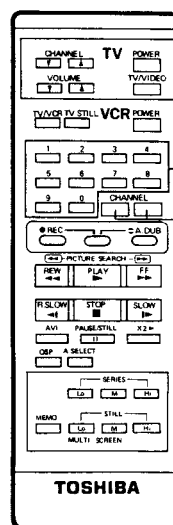


TV/CATV Selector Switch

(Rear Panel)



CATV MODE Selector Switch



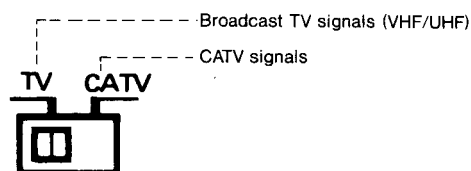
Channel Select Buttons (Direct)

Channel UP/DOWN Buttons.

Note 1: Select a channel by two keys of channel select buttons, such as 02, 03, ..., or 09 when a channel from 2 to 9 is to be selected.

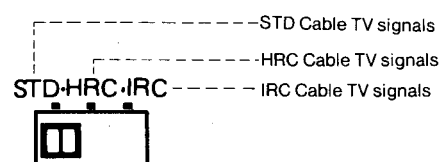
Note 2: When a channel is selected by one key of channel select buttons, such as 2, 3, ..., or 9, check that the channel indicator of the VCR display goes from 2 to 2 after two seconds.

TV/CATV SELECTOR SWITCH



Note: Do not alter the switch setting while recording. If the switch setting is altered, the program picture will change.

CATV MODE SELECTOR SWITCH:



HOW TO FIND OUT YOUR CABLE SYSTEM

1. Change the TV/CATV Selector Switch to the CATV position and the CATV Selector Switch to the STD position.
2. Select various channel and conform whether the channel will lock immediately with perfect picture. If the channel seem to take a few seconds to lock in, your cable system may be an other system. In this case, continue with the following steps.
3. Change the CATV Selector Switch to the HRC position, and try the above procedure again.
4. If you are having a problem with only Channel 5 and 6, you may have an IRC system, so change the CATV Selector Switch to the IRC position.

Note: A table denoting the relation of channels of each TV signal system to the indications of this VCR set is set out on the next page. Some cable companies also offer premium pay channels in which the signal is scrambled. Descrambling these signals for normal viewing requires the use of a descrambler device which is provided by the cable company. Check with your local cable company for more complete information on the available channels.

CHANNEL REFERENCE CHART

NUMBER ON THIS VCR		2	3	4	5	6	7	8	9	10	11	12	13
CORRESPONDING	TV OFF THE AIR	2	3	4	5	6	7	8	9	10	11	12	13
	CATV STD	2	3	4	5	6	7	8	9	10	11	12	13
CHANNEL NUMBER	CATV HRC/IRC	2	3	4	A-7	A-6	7	8	9	10	11	12	13
ACTUAL TV STATION													

14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q
A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q

31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47
31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47
R	S	T	U	V	W	AA	BB	CC	DD	EE	FF	GG	HH	II	JJ	KK
R	S	T	U	V	W	AA	BB	CC	DD	EE	FF	GG	HH	II	JJ	KK

48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66---	83	95	96	97	98	99	1
48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66---	83	SKIP					
LL	MM	NN	OO	PP	QQ	RR	SS	TT	UU	VV	WW	XX	YY	ZZ	AAA	BBB	CCC	SKIP		A-5	A-4	A-3	A-2	A-1	SKIP
LL	MM	NN	OO	PP	QQ	RR	SS	TT	UU	VV	WW	XX	YY	ZZ	AAA	BBB	CCC	SKIP		A-5	A-4	A-3	A-2	A-1	A-8

Note: CATV channel designation is not standardized as broadcast channels are. There may be some variation among cable systems. If in doubt, consult your local cable company.
If you select the skip channel directly, the channel will change to Ch 2.

TO SELECT CHANNELS

1. USING THE CHANNEL SELECT BUTTONS

(With the remote control unit)

- To select Channels 2 through 9, two methods are available. For one digit entry, press 4. Channel 4 will be selected within approx. two seconds.
For two digit entry, press 0 and 4. Channel 4 will be selected immediately.
- To select Channels 10 through 99, the two-digit entry must be used. Example: Press 3 and 5. Channel 35 will be selected immediately. If the second digit is not pressed within two seconds, Channel 3 will be selected.

Note: If a channel number other than that displayed is selected by using the direct key of the remote control, back to channel 2.

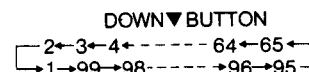
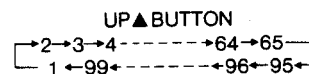
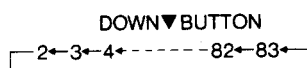
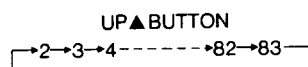
2. USING THE CHANNEL UP▲/DOWN▼BUTTONS

(With the unit or remote control unit)

Press and release the CHANNEL UP▲/DOWN▼ buttons. The channel steps up or down automatically and stops at the next active channel. It will not stop at inactive channels. If you want to select the next active channel, press the button again.

1) TV mode

2) STD, HRC or IRC mode



MULTI DIGITAL PLAY

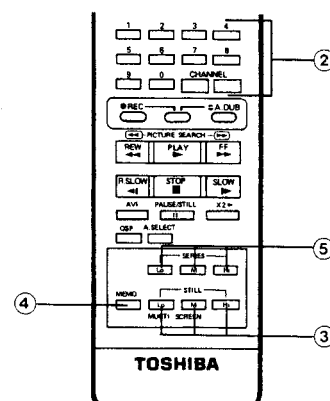
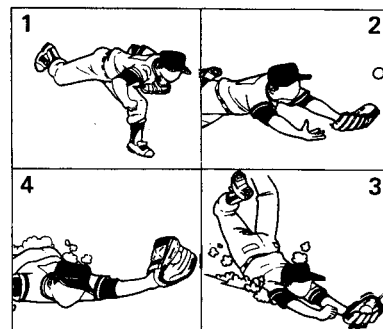
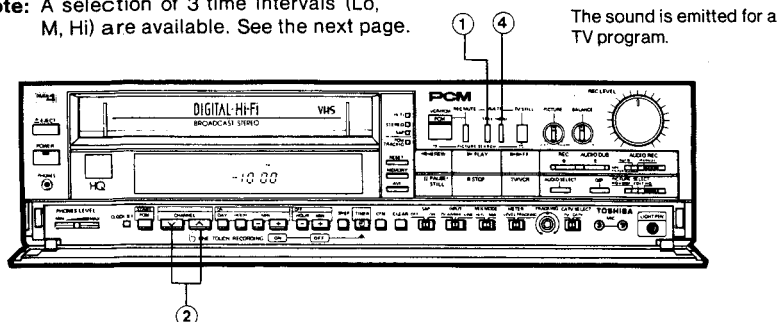
When playing back a tape or watching a TV program with the VCR tuner, various special effect playbacks dividing the picture into four sections can be enjoyed using the digital function.

Multi Still

This function places the four consecutive still pictures into the four divided sections on the monitor.

1. Press the MULTI STILL button ① while watching a TV program or playing back a tape.
2. Four continuous still pictures will appear on the TV screen. The still picture advances slightly in the order of 1→2→3→4.
3. Press again to cancel.

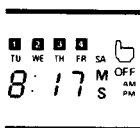
Note: A selection of 3 time intervals (Lo, M, Hi) are available. See the next page.



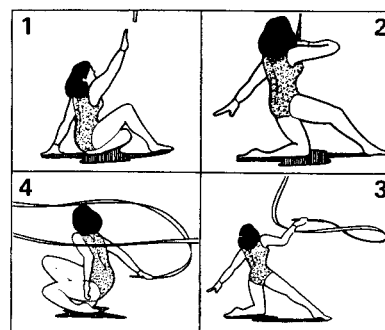
Multi Memo

The four still pictures stopped where you wanted them are placed in the four divided sections on the screen by this function.

1. While watching a TV program or playing back a tape, press the MULTI MEMO button ④ once for each desired picture. The timer display section's multidisplay number is displayed every time a picture is memorized.



2. Each time the MEMO button ④ is pressed, the picture is stored in memory, and when the MEMO button ④ is pressed for the fourth time, the four still pictures will appear simultaneously. Memorized still pictures will appear in the order of 1→2→3→4. The pictures will not be displayed unless the button is pressed four times.
3. Press for the fifth time to cancel.



Sound is emitted during TV programs.

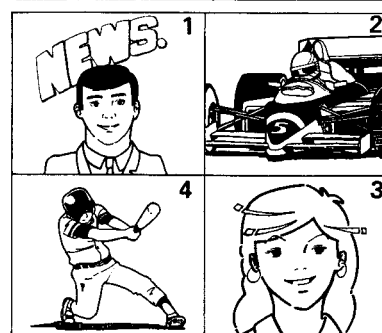
NOTES

If the button is pressed during playback, the feature is automatically cancelled approximately five minutes after the last picture was memorized, and the unit will return to playback. During a TV program, the feature is cancelled by pressing the channel selection button.

When watching a TV program, it is possible to memorize four separate programs by alternately controlling the channel selection button and MEMO button.

For example:


1. While receiving Channel 4, press the MEMO button (first time) and turn the channel to 6.
2. While receiving Channel 6, press the MEMO button (second time) and turn the channel to 8.
3. While receiving Channel 8, press the MEMO button (third time) and turn the channel to 10.
4. While receiving Channel 10, press the MEMO button (fourth time). Still pictures of four channels will be displayed.



Here, the sound of the last channel is emitted.

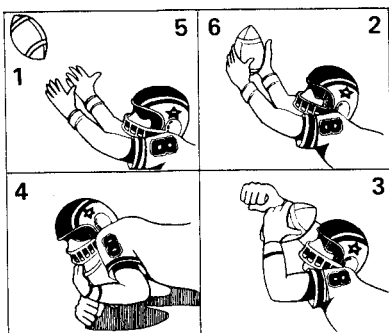
Multi Series

This function displays the consecutive still pictures into the four divided sections on the monitor. Multi Series can be controlled only with the remote control.

While watching a TV program, playing back a tape, or during slow playback or reverse slow playback, press the **SERIES** button  on the remote control to consecutively produce still pictures.

During TV Programs or Normal Playback.

Still pictures are displayed consecutively in the order of $1 \rightarrow 2 \rightarrow 3 \rightarrow 4 \rightarrow 5 \rightarrow 6$. After 4, picture ① is eliminated and replaced by the next still picture.

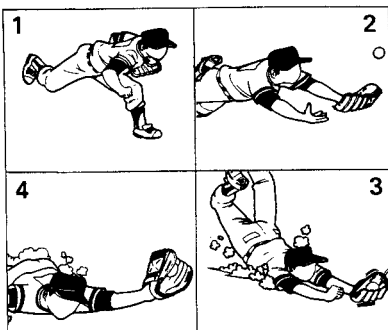


Sound is emitted during TV programs and normal playback.

Press again to cancel.

During Slow Playback.

Slow Multi Series pictures are displayed.



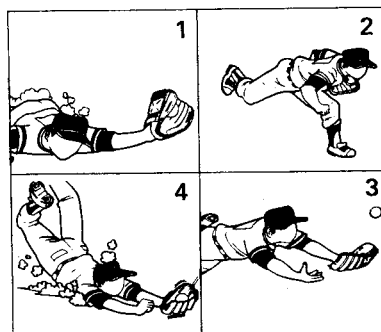
Sound is not emitted during slow playback.

Press again to cancel and return to slow playback.

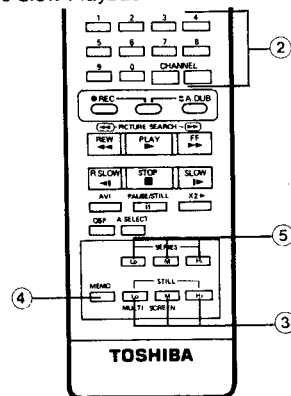
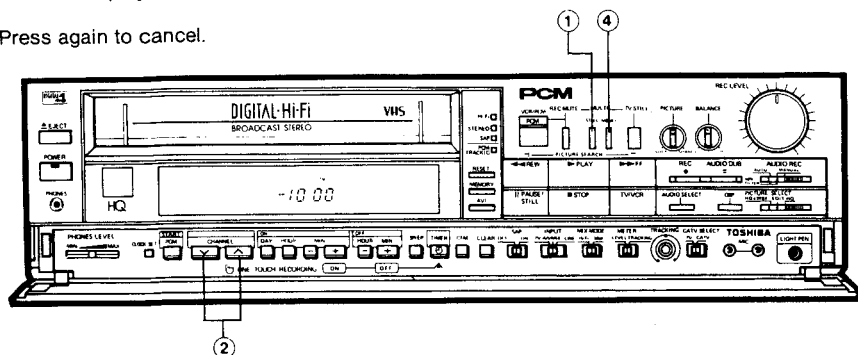
During Reverse Slow Playback

Multi Series pictures of reverse slow playback are displayed.

During Reverse Slow Playback, the pictures are displayed in the order of 1 → 4 → 3 → 2 → 1.



Press again to cancel and return to Reverse Slow Playback.



NOTES

If the button is pressed during playback, the feature is cancelled after approximately five minutes, and the VCR returns to the playback.

Multi Digital Display is not operated during a picture search.

During a TV program, the feature is cancelled by pressing the channel selection button ②.

Multi Series during slow playback is automatically cancelled after approximately five minutes to return to normal playback.

Multi Series during Reverse Slow Playback is automatically cancelled after approximately one minute to return to normal playback.

Distortions and picture flutters may occur in the upper part of the picture, but this is not due to malfunctions.

The display times of Multi Still and Multi Series may be changed with the remote control. To change the display time, cancel the operation in progress and press Multi Still change switch ④ and Multi Series change switch ⑤. Changing the switch during an operation will not change the display time.

Multi Still

Lo Still pictures 8 frames apart will be displayed.

M..... Still pictures 4 frames apart will be displayed.

The unit's button is fixed to the "M" speed.

Hi Still pictures 2 frames apart will be displayed.

Multi Series

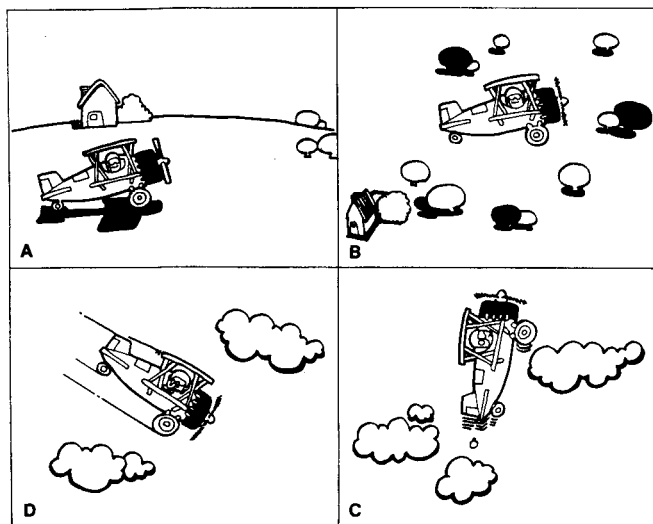
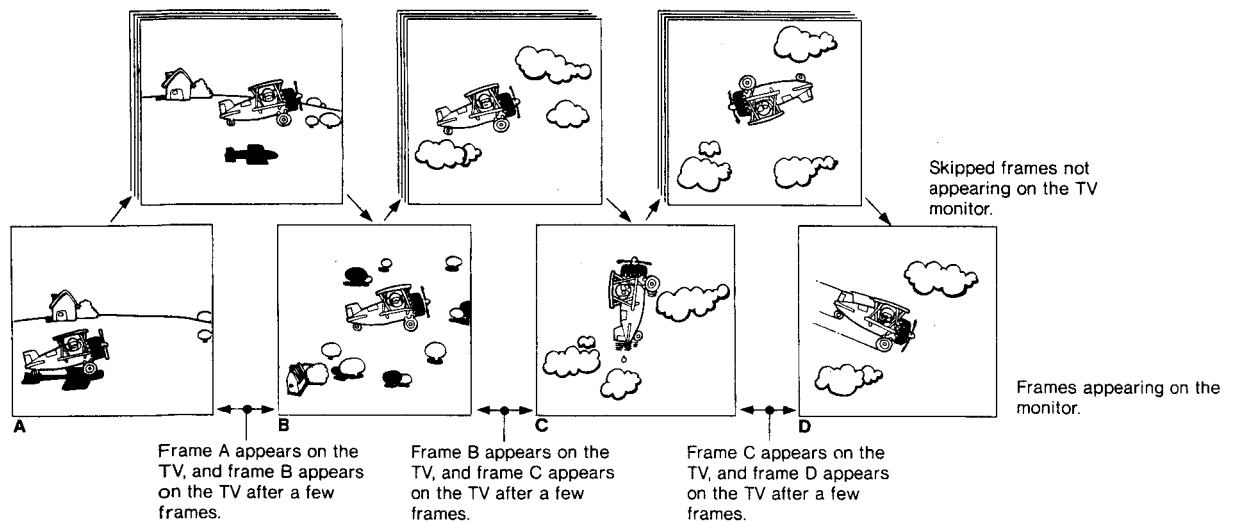
Lo A series of different pictures 32 frames apart will be displayed.

M A series of different pictures 16 frames apart will be displayed.

Hi A series of different pictures 8 frames apart will be displayed.

Brief Summary of Multi Digital Play

A still picture is shown on the TV, and after skipping a few frames, another still picture is shown. Then four still frames compose the TV picture.



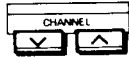


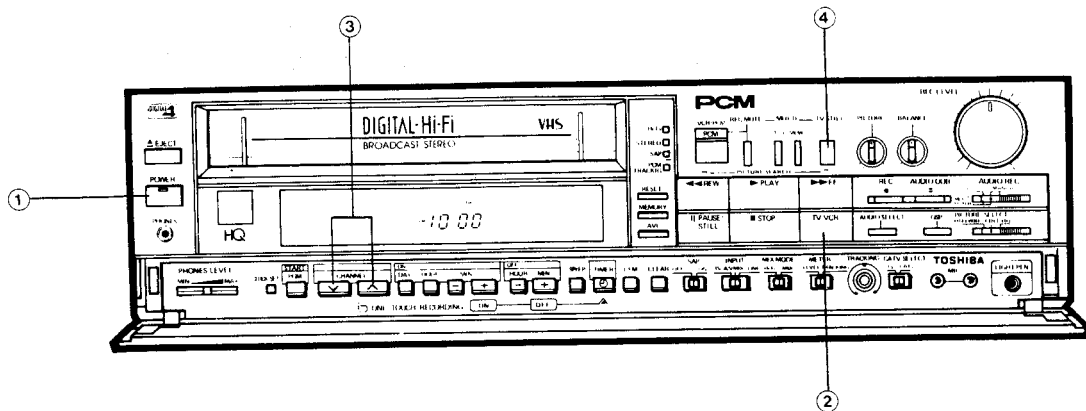
The TV monitor when the four frames are shown.



Hi, M and Lo speed modes are available for Multi Still and Multi Series modes. The speed mode governs the number of frames not appearing on the TV (the interval of time between one frame and another frame appearing on TV).

Digital TV Still

When using a TV to view pictures from the video tuner or line input, press the TV STILL button to stop the TV picture.

1 Press the POWER button ①. <div style="text-align: center; margin-top: 20px;">  </div>	2 Press the TV/VCR button ②. (VCR lamp lights.) <div style="text-align: center; margin-top: 20px;">  </div> Set the VCR Output channel of TV to 3 or 4.	3 Press the CHANNEL selector buttons ③ to select desired channel. <div style="text-align: center; margin-top: 20px;">  </div>
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4 Press the TV STILL button ④ to stop the picture. <div style="text-align: center; margin-top: 20px;">  </div> Sound continues.	5 Press the TV STILL button ④ again to release the picture. <div style="text-align: center; margin-top: 20px;">  </div>	Note <ul style="list-style-type: none"> • None of the operation buttons work during recording or playback. • The TV still frame is cancelled when any operation button is pressed. • The TV still frame cannot be recorded. • Correct recording may not be possible when attempting to record the TV still frame on another video. • Remote control is possible.
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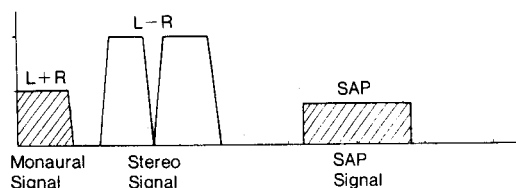
MTS (Multi Channel TV Sound)

You can enjoy Multi-Channel TV Sound, even if you are viewing a monaural sound TV by using a Headphones, or Stereo AMP and speakers.

Signal Indicator

Using the indicators described below, you can check the type of signal being received.
 STEREO ● When a program in stereo is received, the STEREO indicator lights on.
 SAP ● When second Audio Program is received, the SAP indicator lights on.

Multi-Channel TV Sound Chart



SAP: (Second Audio Program)

Hi-Fi Audio Recording of Stereo and SAP Broadcasts

STEREO, SAP or STEREO & SAP broadcasts are recorded on the tape in Hi-Fi and NORMAL Sound simultaneously, when STEREO and SAP indicators lights on. Use the recording operations in "Basic Manual Recording" on page 27 for Hi-Fi recording with the addition of the SAP recording setting described below.

Condition of VCR			Signal of Broadcasts	Contents of recorded sound		
"MIC" jack	"INPUT" SW	"SAP" SW		Normal sound (Monaural)	Hi-Fi Sound Track	
					L	R
Non Connect	TV	—	MONO	TV MONO	TV MONO	TV MONO
		—	STEREO	TV MONO	TV L	TV R
		OFF	MONO + SAP	TV MONO	TV MONO	TV MONO
		ON			TV MONO	TV SAP
		OFF	STEREO + SAP	TV MONO	TV L	TV R
		ON			TV MONO	TV SAP
	A/V MIX	—	—	TV MONO	LINE L	LINE R
	LINE	—	—	LINE L + R	LINE L	LINE R
Connect	—	—	—	MIC L + R	MIC L	MIC R

PLAYBACK (or Monitoring During Recording) of STEREO AND SAP Sound

Press AUDIO SELECT Switch to select the type of audio sound and broadcast combination you desire to monitor or playback.

Hi-Fi L + R → Hi-Fi L → Hi-Fi R → NORMAL

	Stereo Broadcast	SAP Broadcast
L	L/R	Main channel from L
R	L/R	SAP channel from R
L	L	Main channel
R	R	SAP channel
—	Monaural	Monaural



Simulcast Recording and Playback

While recording a TV program from some TV broadcast, such as MTV, HBO or MAX, if the TV program is also being simulcast in FM stereo, this VCR can also simulcast record the sound with your FM stereo tuner or receiver onto the Hi-Fi sound track.

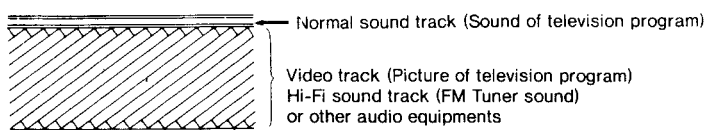
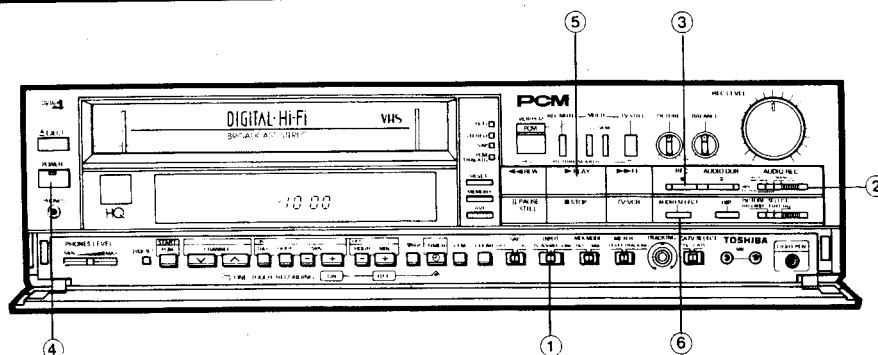
Simulcast Recording

<p>1</p> <p>Connect the AUDIO INPUT terminal (L/R) and the audio equipment output terminal. (See Fig. 2 on page 9)</p>	<p>2</p> <p>Recording is the same as for "Basic Manual Recording" (items 1-6 on the page 27.)</p>	<p>3</p> <p>Set the INPUT SELECT switch ① to A/V MIX.</p> <div style="text-align: center;"> </div>	<p>4</p> <p>Set the AUDIO REC Switch ② to AUTO.</p> <div style="text-align: center;"> </div>
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5

Press the REC button ③

Simulcast recording will begin.



Playback the TV program recorded in Simulcast (When connect the audio equipment)

<p>1</p> <p>Turn the TV on and set the VCR output channel. (Channel 3 or 4)</p> <div style="text-align: center;"> </div>	<p>2</p> <p>Push the VCR POWER ④ on. The Auto Power On function will be activated when a tape is loaded into the unit.</p> <div style="text-align: center;"> </div>	<p>3</p> <p>Insert the Simulcast-recorded tape.</p> <div style="text-align: center;"> </div> <p>Make sure that the cassette tab is intact. If a cassette without a safety tab is inserted Full-Automatic Play will begin.</p>	<p>4</p> <p>Press the PLAY button ⑤</p> <div style="text-align: center;"> </div>
---	--	--	---

5

Press the AUDIO SELECT button ⑥ and to select the type of audio sound.

Indicator	Contents of Output Sound
L R	L/R
L	L ch
R	R ch
—	Monaural (TV sound)

Audio Hi-Fi Recording


This VCR can also be used as an Audio Tape Recorder for Hi-Fi long recording (max. 8 hrs. in EP mode ... When using T-160 cassettes).

1

Connect the AUDIO INPUT terminal (L/R) and the audio equipment output terminal.

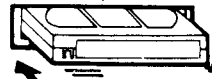
2

Push the VCR POWER ① on.
The Auto Power On function will be activated when a tape is loaded into the unit.

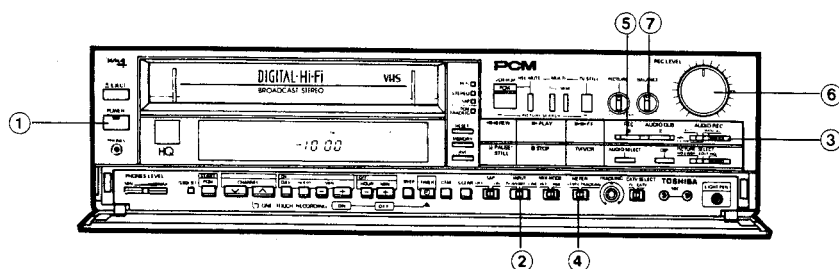


3

Insert a video cassette.




Make sure that the cassette tab is intact. If a cassette without a safety tab is inserted Full-Automatic Play will begin.



4


Set the INPUT select switch ② to LINE.



The timer display section's channel display is turned off and the LINE display is turned on.


5

Set the AUDIO REC switch ③ to MANUAL.




6

Set the METER switch ④ to LEVEL.




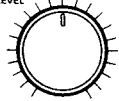

7

Press the REC button ⑤.



8

Refer to the level meter and adjust with the REC LEVEL control ⑥ and BALANCE control ⑦.

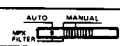




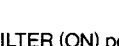




Level adjustment
Adjustment differs depending on the sound source.
Recording conversations: The red + 5 lamp is constantly lit.
Use the above as a guideline and try various settings.

REC LEVEL Switch



- Simultaneous setting of both AUTO/MANU and MPX FILTER switches (Multiplex).
- Capable of the following three combinations.

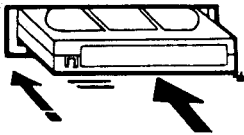


AUTO/MANU	MPX FILTER	SOURCE (recommended)
AUTO 	(ON) 	FM Tuner
MANU 	(ON) 	TV Tuner
MANU 	(OFF) 	CD player AUDIO player

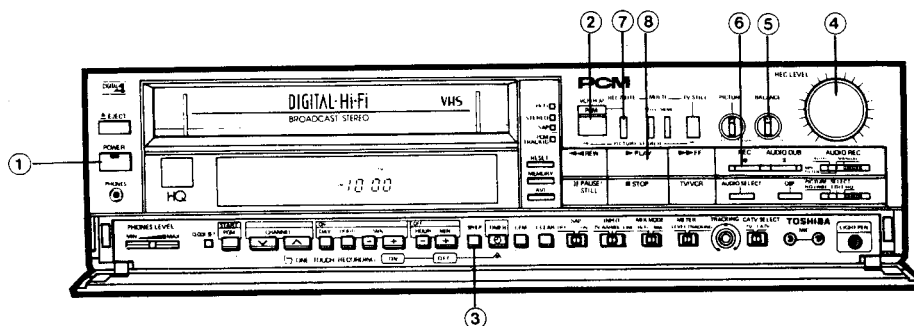
- AUTO/MPX FILTER (ON) position is recommended.

PCM Recording and Playback

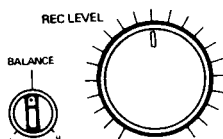
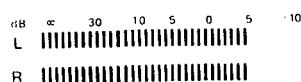
This VCR houses a PCM digital processor for enjoying PCM recording and playback of superior sound quality using the tape's video tracks.

PCM Recording

<p>1</p> <p>Connect the AUDIO INPUT terminal (L/R) and the audio equipment output terminal.</p>	<p>2</p> <p>Push the VCR POWER ① on. The Auto Power On function will be activated when a tape is loaded into the unit.</p>	<p>3</p> <p>Insert a video cassette.</p>  <p>Make sure that the cassette tab is intact. If a cassette without a safety tab is inserted Full-Automatic Play will begin.</p>	<p>4</p> <p>Press the VCR/PCM Switch button ②. At this time, set the Tape Speed Selector ③ to SP or EP.</p> <div style="display: flex; justify-content: space-around; align-items: center;"> <div style="text-align: center;"> <p>VCR/PCM</p> <p>PCM</p>  </div> <div style="text-align: center;"> <p>SP/EP</p>  </div> </div> <p>The PCM lamp lights.</p>
--	---	---	---



Adjust the recording level and recording balance with the REC LEVEL control ④ and BALANCE control ⑤. Adjust the recording so that when the loudest sound is recorded, the peak level meter does not exceed +5. If the level exceeds +5, distortion may occur during playback.



Press the REC button ⑥.



PCM recording will begin. The PCM pattern will appear on the TV screen.

When the REC button is pressed in the PCM mode, a PCM pattern shown in the photograph will appear on the TV screen.

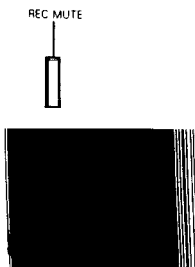


- The AUDIO REC change switch does not function during PCM recording. The recording level is adjusted using the REC LEVEL knob.
- The Hi-Fi recording level is automatically adjusted during PCM recording. The appropriate recording level differs depending on the sound source.
- By adjusting the level with the REC LEVEL knob so that +5 does not light when the loudest sound is recorded, a superior S/N ratio and distortion free recording will be obtained.
- During PCM recording, the VCR is always set to LINE and is not effected by the setting of the INPUT change switch.

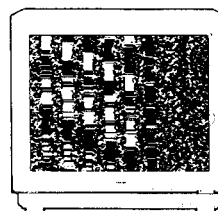
REC MUTE

Rec Mute is a function for cutting unnecessary portions during recording, and creating adequate sound-free sections between songs.

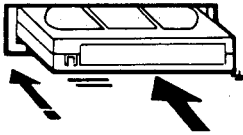

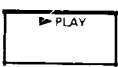
Press the REC MUTE button ⑦ when sections you wish to cut, such as commercials and narration, appear during recording. As long as the button is pressed nothing is recorded on the tape while it advances, creating a blank section. The TV screen looks like this picture while the REC MUTE button ⑦ is pressed.

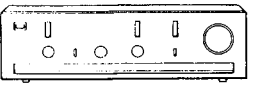
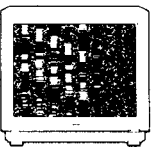


Recording is restarted when the button ⑦ is released. Hi-Fi sound and normal sound are recorded during REC MUTE.



PCM PLAYBACK

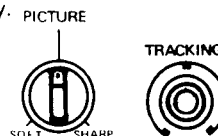
1	2	3	4
Connect the AUDIO OUTPUT (PCM/HiFi/NORMAL) terminal (L/R) and the audio equipment input terminal.	Insert a video cassette.  Make sure that the cassette tab is intact. If a cassette without a safety tab is inserted Full-Automatic Play will begin.	Press the VCR/PCM button ②  The "PCM" lamp lights.	Press the PLAY button ⑧ 

1	2
Adjust the amp volume. 	When a PCM recorded tape is played back, a PCM pattern like the one shown here will appear on the TV screen. 

PCM TRACKING ADJUSTMENTS

When tapes recorded in PCM on another VCR are played back, many dropouts may occur due to recording track aberration. For optional playback, make tracking adjustments by referring to the PCM TRACKING display.

1. Set the PICTURE knob to the center position.
2. Adjust the TRACKING knob so that the PCM TRACKING display lamp is constantly lit.
3. Twist the PICTURE knob to the position where the PCM TRACKING display lamp is constantly lit.



PCM TRACKING Display

This indicates whether the PCM digital data is logically correct as data. The video performance is evaluated only in terms of PCM digital data, so this display does not indicate picture quality.

- ☒ **Lit:** When there are few errors
- ☐ **Blinking:** When there are many errors and when the tracking is slightly off.
- ☐ **Off:** When there is an extreme number of errors and when the tape is not PCM-recorded.

NOTES

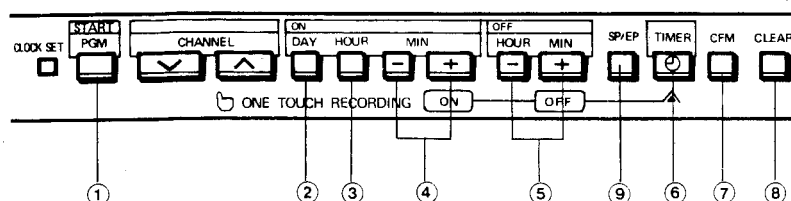
- PCM-recorded tapes have a wide dynamic range, and compared to analog video tapes the highs are accurately recorded and the noise level is low. For this reason, if the amp volume is carelessly increased because of low volume during playback of blank sections and low signal level sections, the speakers may exceed the input capacity at peak levels, causing them to be damaged. Please be careful of the amp volume adjustments. In particular do not make volume adjustments as you are listening to the noise of blank sections.
- When playing back a tape whose tabs are broken, reduce the amp volume before inserting the tape into the VCR.
- The level meter's L and R will not light up when playing back a tape recorded solely in PCM.

Programmable Timer Recording

The Programmable Timer is one of the DX-900's most valuable features. It lets you record up to four different programs over a period of two weeks when you are not at home or are busy. All you have to do is set the timer to the appropriate day, time and channel for the program you want recorded.

The One Touch Timer can also be used (i) when you want to begin recording immediately or; (ii) when you want to record a program automatically within 24 hours. See the section, One Touch Timer for details.

First, use this illustration to locate the buttons you will need to preset the timer.



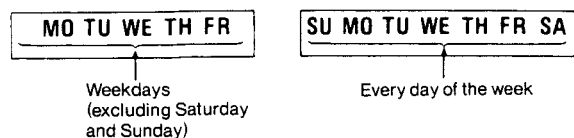
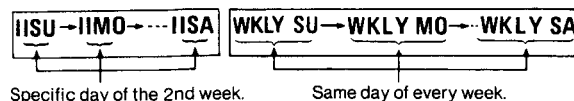
Timer programming can be performed on the TV screen with the light pen (Timer screen function).

① PGM/START Button

Used to activate the Programmable Timer function and to set the program number in which you preset the times for an automatic, unattended recording program.

② DAY Button

Used to set the day on which you want to program a recording. When pressed once, the day advances by one day. When pressed down continuously, the days advance in rapid succession.



③ HOUR Button

Used to set the hour of the recording start time. When the button is pressed once, the time displayed advances by one hour. When pressed down continuously, the hours advance in rapid succession.

④ MIN -/+Buttons

Used to set the minutes of the recording start time. The "-" button subtracts minutes from the time displayed and the "+" button adds minutes. Similar to the DAY and HOUR buttons, these buttons can be used to add or subtract minutes one-by-one or in rapid succession.

⑤ HOUR/MIN Button

Used to set the hour and minutes of your recording end time. In the same manner as the time setting buttons above, these buttons can be used to add or subtract time units one-by-one or in rapid succession.

⑥ TIMER Button

Pressed when the preset times have been set for the recording start and end times. The timer will set the VCR stand by until the present time reaches the nearest preset time.

⑦ CFM (Confirm) Button

Used to check the contents of the preset recording program to see if everything has been set correctly.

⑧ CLEAR Button

Used to erase the programmed contents.

⑨ SP/EP Tape Speed Selector

Select a tape speed. (SP or EP)

This VCR enables you to set the timer reservation on the TV screen.

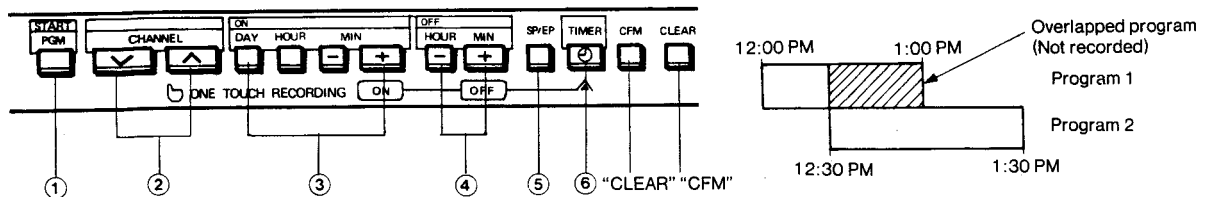
Setting the Programmable Timer

First check the present time on the clock. Then, insert a cassette (check to make sure that the cassette safety tab has not been removed).

The timer can be set to start recording on any day of the week (MON through SUN two weeks in advance from the present time), the same day of every week, weekdays (MON-FRI) or everyday. When setting the Programmable Timer, be careful not to overlap the preset times.

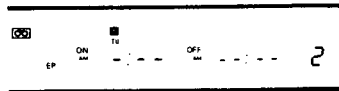
If you happen to overlap the preset programs, the start time has priority, and the overlapped programs cannot be recorded. Verify the programmed times by pressing the CFM button.

Follow the steps outlined below to preset programs into the timer's memory.



Example: To set Channel 6 on Saturday from 8:02 pm to 9:45 pm, as Program 2. (The present time is Tuesday, 8:21 am.) Tape speed is set to SP.

1. Press the PGM/START button ①.

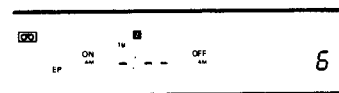


(The display shows that nothing has been set yet.)

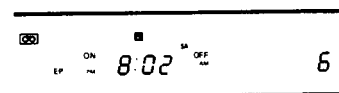
2. Press the PGM/START button ① and select one of the four available programs. In our example, we set program "2".



3. Set the channel by pressing the CHANNEL select button ②. In our example, we are setting channel "6".



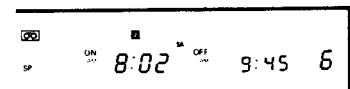
4. Set the recording start time by pressing the DAY, HOUR, MIN, + and MIN, - buttons ③. (ex: Saturday 8:02 PM). This procedure is the same as for setting the VCR clock.



5. Set the end time in the same way as step 4, using the HOUR/MIN buttons ④ this time. (ex: Saturday 9:45 PM).



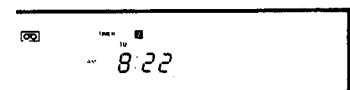
6. Set the tape speed by pressing the SP/EP button ⑤. In our example, we are setting tape speed "SP".



7. Press the PGM/START button ① to change the program number.

To repeat two or more programs, repeat steps 3 through 6. A maximum of four programs can be programmed into the time memory.

8. Press the TIMER button ⑥. TIMER is displayed on the multidisplay.



Note: A CATV program cannot be reserved together with a UHF program.

NOTES

- If the cassette has the safety tab removed, it will be ejected if the Timer button is depressed.
- After entering the Timer mode the programmed contents can only be changed by clearing the entire program.

Setting Programs for Specific Day of First Week/Specific Day of Second Week/Same Time Every Week/Every Weekday/Every Day

First, follow steps 1 through 5 of Setting the Programmable Timer.

1. When you want to record program on a specific day of the first week. Press the DAY button ③ once. The day indicator advances by one day.
2. When you want to record a program on a specific day of the second week. Press the DAY button ③ until the "II" indicator lights on the multidisplay.
3. When you want to record the same program at the same time on the same day each week. Press the DAY button ③ until the WKLY indicator lights on the multidisplay.
4. When you want to consecutively record programs at the same time every weekday (MO-FR), press the DAY button ③ until only the weekday indicator is displayed (MO-FR).
5. When you want to consecutively record a program at the same time every day (SU-SA), press the DAY button ③ until all day of the week indicator is on the display light. When you press the DAY button ③, the indicators on the display will advance according to the cycle shown below.



2. When you want to record a program on a specific day of the second week. Press the DAY button ③ until the "II" indicator lights on the multidisplay.



5. When you want to consecutively record a program at the same time every day (SU-SA), press the DAY button ③ until all day of the week indicator is on the display light. When you press the DAY button ③, the indicators on the display will advance according to the cycle shown below.



3. When you want to record the same program at the same time on the same day each week. Press the DAY button ③ until the WKLY indicator lights on the multidisplay.



FOR BETTER UNDERSTANDING OF THE 14-DAY TIMER

This VCR has the 14-day timer. This function is very convenient, but unless you understand it correctly you might not be able to record the desired program.

Accordingly, please perform the 14-day timer operation when you have read through the following explanation carefully and comprehend what this timer is. The figure below shows that the present time is 10:00 AM, and how the coming 14 days are divided into the first week and the next week.

Keep this in mind as it will help you to understand what follows.

SUNDAY	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY
			present time 10:00 AM			
				(First week)		
				(Next week)		

→ SU→MO...SA→IISU→IIMO...IISA→WKLY SU→WKLY MO...WKLY SA→MO, TU, WE, TH, FR
(specific day) (specific day of the 2nd week) (weekly) (Weekdays)

→ SU, MO, TU, WE, TH, FR, SA
(every day)

(The clock's date is displayed from the same day of the week)

NOTE

It is possible to set each program (1-4) to record consecutive days and/or weeks.

Error Indication

When the timer program has been entered improperly or the loaded cassette does not have a safety tab, the letter "E" will appear on the multidisplay. This indicates an error. The "E" symbol appears only for as long as the TIMER button is pressed down, then immediately disappears. A cassette without a safety tab will be ejected automatically.

E

(Displayed when the TIMER button is pressed.)

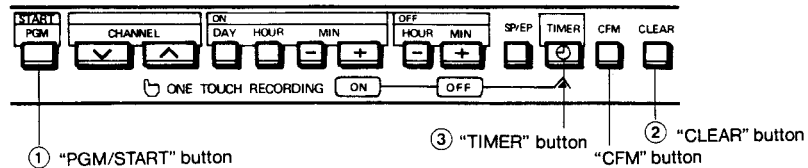
Confirming Programmed Contents

Press the CFM (confirmation) button and the programs entered on numbers 1 through 4 are automatically displayed in succession. The display then returns to the original clock mode. The program numbers flash during the time they are displayed. The contents of each program will be displayed for approximately five seconds, in the following orders:

Present time - Contents of No.1 - Contents of No.2 - Contents of No.3 - Contents of No.4

NOTE

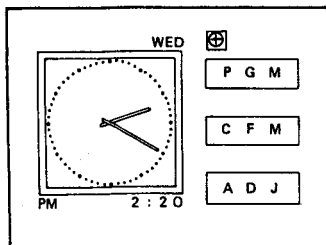
If the CFM button is pressed again, the contents of the next program is displayed less than five second.



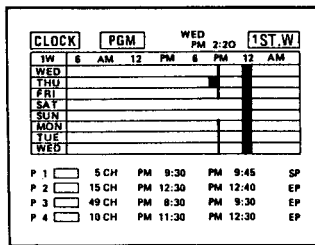
The Timer Screen function can be used to confirm on the TV screen the contents of timer programming done with the VCR main unit. Unit and remote control button.

1. Turn the TV on and set VCR output channel (Channel 3 or 4).
2. Push the VCR POWER ① on.
3. Press the OSP button ②.

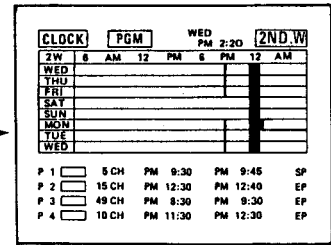
Press the OSP button ② once.



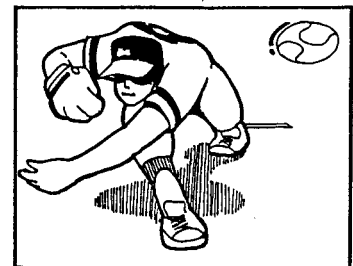
Press it twice.



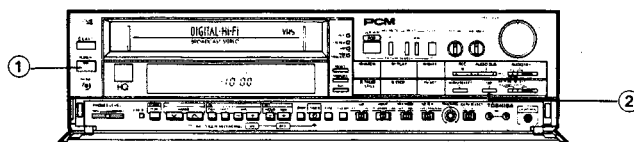
Three times.



Four times.





Returns to CLOCK & MENU screen when pressed five times.





Clearing Contents

If you noticed a mistake when confirming the preset programs, you can clear a particular setting by following the steps listed below.

1	2	Notes
<p>Press the PGM/START button ① to select the program you want to erase.</p> 	<p>Press the CLEAR button ② to erase the contents of the selected program.</p> 	<ul style="list-style-type: none"> • Except for programs set for everyday, everyweek or weekdays, preset programs are automatically erased once the recording has been completed. • When there has been a power failure that lasts longer than the VCR's back-up time the time display flashes "SU ... SA AM 12:00" to inform you that the back-up time has run out when the power comes back on.

Using the VCR During Timer Stand-by for Normal Playback and Recording.

You can use the VCR for normal playback and recording even when it is in the Timer Stand-by mode ("TIMER" lamp is lit on multidisplay). To do this, follow the procedure outlined below.

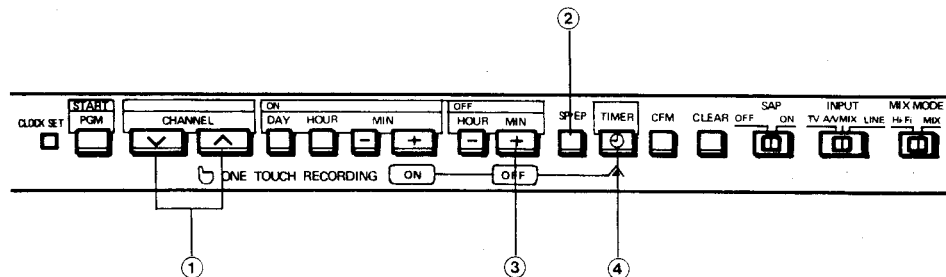
1	2	3	4
<p>Press the TIMER button ③ even when the VCR power is off.</p> 	<p>Turn the VCR on with the POWER button.</p> 	<p>Follow the normal procedures for recording and playback.</p>	<p>When you have finished using the VCR for normal purposes, press the TIMER button ③ again and the VCR will return to the Timer Stand-by-mode.</p>

One-Touch Timer Recording (I and II)

The DX-900's One-Touch Timer function lets you program the VCR to record a TV program either immediately or within 24 hours from the present time. One-Touch Timer recording can be done only with the power on.

One Touch Timer Recording I (Immediate Recording)

This procedure is used when you want to begin recording immediately.



① CHANNEL ∇/Δ Buttons

These buttons are used to set the TV channel to be recorded.

② Tape Speed Selector

Press this button to set the tape speed to SP or EP.

③ OTR OFF Button

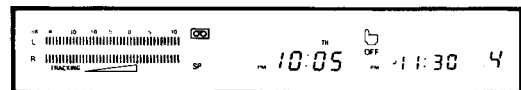
The OTR OFF button is used to set the stopping time. When you press the button once, thirty minutes or less are added from the closest previous hour or half hour to your present time.

④ TIMER Button

This button is pressed when the recording time has been set, to begin the OTR recording cycle.

EXAMPLE: To record Channel 4 starting from now until 11:30 PM. (Example with present time) 10:05 pm, Thursday, tape speed SP.)

1. Make sure that the power is on and the TV channel is set to Channel 4.
2. Set the tape speed selector ② to SP.
3. Press the OTR OFF button ③ to set the recording OFF time. When this button is pressed the symbol will appear on your multidisplay.

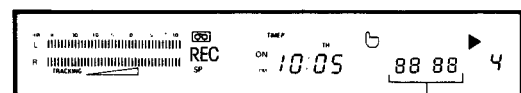


When the button is pressed once: pm 10:30 (25 min.)
When the button is pressed twice: pm 11:00 (30 min.)
When the button is pressed 3 times: pm 11:30 (30 min.)

Total: 1 hour and 25 minutes

IMPORTANT: If the TIMER button is not pressed within nine seconds, the OTR time entered is cancelled and the display returns to the clock mode.

4. Press the TIMER button ④ and the recording begins. TIMER and are displayed. The clock displays the present time and the counter starts.



Counter

NOTE

If you have already made a program with the Programmable Timer for a certain time and want to record over that time later with the OTR function, all you need to do is follow the above procedure for One-Touch Timer Recording. The OTR function always has priority over the Programmable Timer.

NOTES

To confirm the programmed contents during One-Touch Timer recording, press the CFM button.

When setting the OFF time, note that THIRTY MINUTES ARE ADDED EVERY TIME THE OTR OFF button is pressed for a total of up to four hours. The indicator on the multidisplay returns to the counter display after the button has been pressed nine times (240 minutes) and OTR is cancelled.

Please note that the timer adds thirty minutes to the closest previous half hour, not the exact present time. For example, our present time is 10:05. When the OTR OFF button is pressed once, the timer indicates the time as 10:30. This means five minutes less from the half hour. If the present time is 10:29 and you press the OTR OFF button, the first timer recording will be 10:30. If the present time is 10:45 and you press the OTR OFF button once, your first timer recording will be 11:00, and so on. This means that your total possible time is 240 minutes maximum. For example, if the present time is exactly 10:00 or 10:30, you can record for this maximum amount of time.

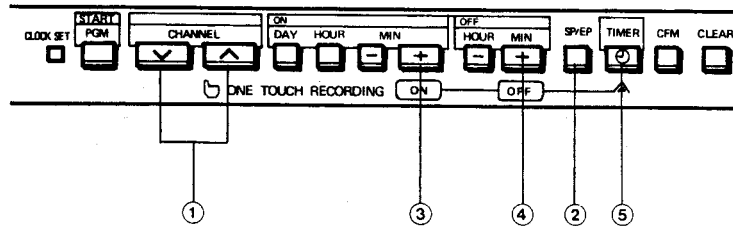
EXAMPLE:

	1) Present time 10:29 AM (1 minute)	2) Present time 10:01 AM (29 minutes)
	When the button is pressed once→10:30 AM pressed twice→11:00 AM pressed 3 times→11:30 AM	When the button is pressed once→10:30 AM pressed twice→11:00 AM pressed 3 times→11:30 AM
Advances at exactly thirty minute intervals after going pressed twice.	pressed 8 times→2:00 PM pressed 9 times→Counter display	pressed 8 times→2:00 PM pressed 9 times→Counter display.

Your minimum recording time is one min. Your maximum recording time is four hours.

One Touch Timer Recording II (Within 24 hours)

Use this procedure when you want to make a recording within twenty-four hours and do not have the time (patience) to set the Programmable Timer in the conventional way.



① CHANNEL Buttons

Used to set the TV channel to be recorded.

② Tape Speed Selector

Pressed to set the tape speed to SP or EP.

③ OTR ON Button

Used to set the time when you want the timer to begin recording. When the button is pressed once, thirty minutes will be added to the closest previous hour or half hour to your present time.

④ OTR OFF Button

Used in OTR II to set the stopping time. When the OTR OFF button is pressed, the time advances at intervals of thirty minutes from the time set by the OTR ON button.

⑤ TIMER Button

Pressed when the recording time has been set to begin the OTR recording cycle.

NOTE

Make sure that OTR is set in correct order so that it will work correctly.

EXAMPLE: To record Channel 4 starting from 10:00 am to 11:00 am (Example: present time 7:10 am, tape speed SP).

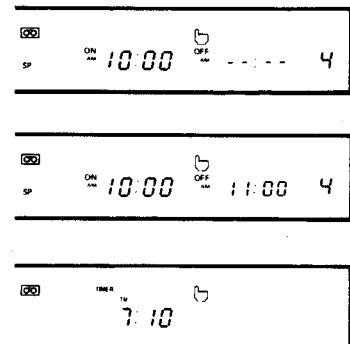
1 Make sure that the power is ON and set the TV channel to Channel 4.

2 Set the tape speed to SP.

3 Press the OTR ON button ③. Set the timer to 10:00 am. At this time the symbol will appear on your multi-display. Press the OTR ON button ③ once and the display will show the time 7:30 am. Press the button five more times and the display will have reached the 10:00 am setting. After the OTR ON time reaches 24 hours from the present time, the timer will return to the clock mode.

4 Press the OTR OFF button ④ to set the stopping time at 11:00 am. Pressing the button once will set the time ahead thirty minutes. Recording time is limited to four hours.

5 Press the TIMER button ⑤ to set the OTR to the Stand-by mode. When the present time reaches the preset OTR ON time, the VCR timer will automatically record the preset program while the VCR is unattended.






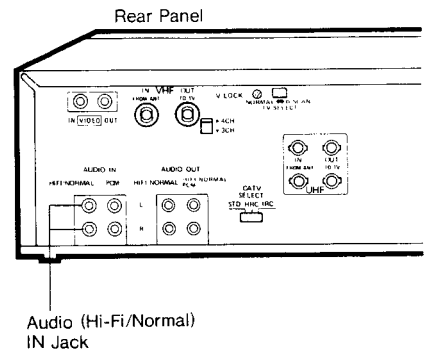
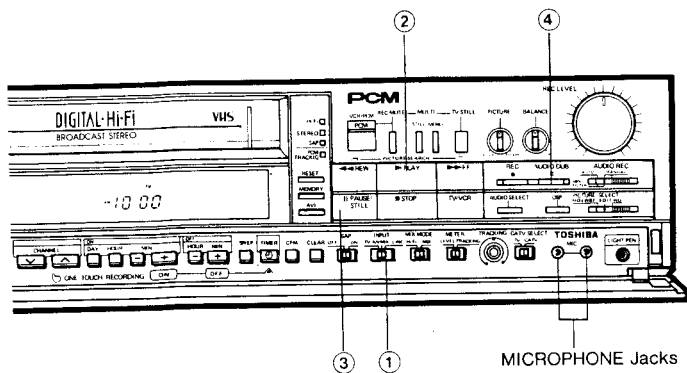
IMPORTANT: If you do not press the TIMER button within nine seconds after setting the OTR OFF time, the preset time will be cancelled and the display returns to the normal clock mode.

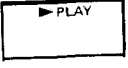



Audio Dubbing

This VCR is equipped with an After Recording function which allows you to add sound only, on tape which has been recorded. You can add music or sound effects to match the recording contents, or make your own commentaries, or whatever you wish.

Using the After Recording Function

<p>1</p> <p>Connect the microphone to the microphone jacks to use it during after-recording. To use audio equipment during after-recording, connect it to the AUDIO (Hi-Fi/normal) IN jack. Set the INPUT SELECT switch ① to the LINE position.</p>	<p>2</p> <p>Turn the TV on and set the VCR output channel (3 or 4).</p> 	<p>3</p> <p>Correctly insert the recorded tape for after-recording.</p>  <p>NOTE: After-recording cannot be done on tapes which do not have the safety tab attached.</p>	<p>4</p> <p>Check the PCM Display.</p>  <p>If the PCM lamp is on, then turn it off by pressing the VCR/PCM switch button.</p>
--	--	--	---



<p>5</p> <p>Press the PLAY button ②.</p> 	<p>6</p> <p>When you want to start audio dubbing, press the PAUSE/STILL button ③ and the frame then showing will be partially frozen.</p> 	<p>7</p> <p>Press the AUDIO DUB button ④ to enable the After Recording function.</p> 	<p>8</p> <p>Press the PAUSE/STILL button ③ to start audio dubbing.</p> 
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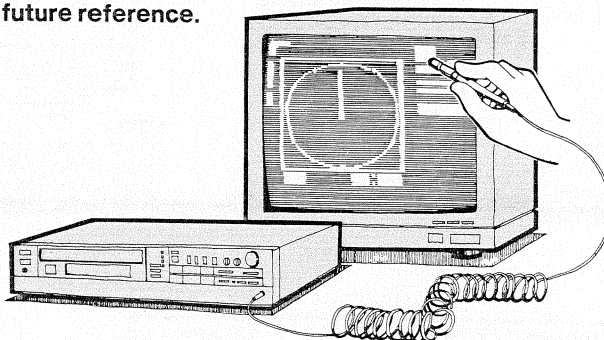
NOTES

- The After Recording function does not work for TV sound.
- Sound only cannot be entered into a tape which has not already been video-recorded.
- When after-recording, only the normal sound track is recorded (monaural). Hence, if after-recording is performed on tape already recorded in Hi-Fi, the picture and the sound (Hi-Fi sound) will remain.

How to Use the Timer Screen

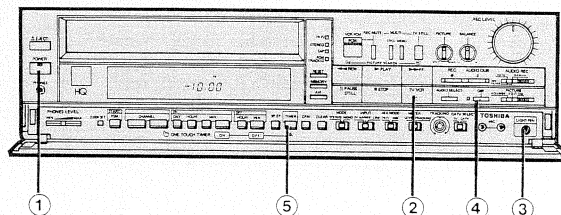
Using a light pen, timer reservations may be made on the TV screen with this VCR. It is a simple operation of following the color instructions, displayed in characters and figures, necessary for timer reservation and touching the TV screen with the light pen. Please read the section "How to Use the Timer Screen" and the separate owner's manual before using this VCR, so that you can get the best use out of the functions.

Retain this information for future reference.



Before Using the Timer Screen

1. Turn on the TV power, and set the VCR output channel (Channel 3 or 4).
2. Turn on the VCR power ①, and set the TV/VCR button ② to VCR.
3. Connect the light pen to the light pen jack ③ on the VCR.
4. Press the OSP button ④. The initial screen (Clock Set Mode) is displayed on the TV screen.



NOTES

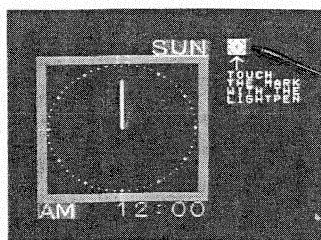
- Since the light pen is made of optical fibers, do not forcefully bend or stretch it as this may cause the performance to degenerate or the light pen to be unplugged.
- Hold the plug when removing the light pen. Pulling on any part other than the plug is dangerous as the plug will fly out of control.

This initial screen is displayed before the clock has been adjusted, either when the power plug is first connected to the power outlet, or after a power interruption.

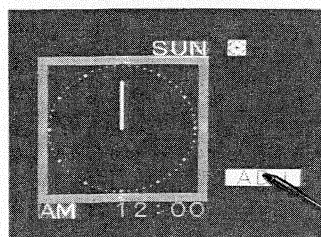
NOTE:


If the time is not set, the other screens are not displayed.

How to Set the Present Time (taking the example of 2:20 p.m., Wednesday)



The initial screen

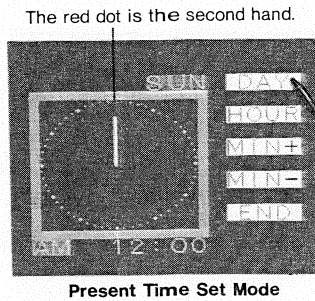


First, press the  mark with the light pen. The ADJ screen will replace the initial screen.

Second, press ADJ with the light pen. The PRESENT TIME SET Mode will appear.

NOTE:

For each light pen operation, press the center of the white frame. If the operation is correct, a short confirmation tone, "beep," will sound.

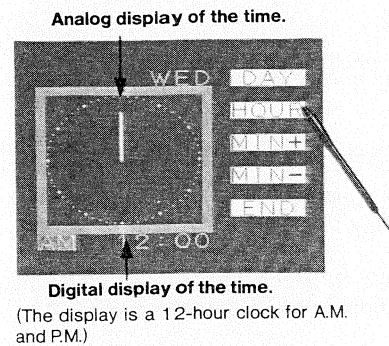


Day display. This display is adjusted by pressing DAY with the light pen.

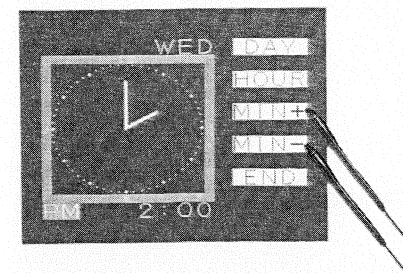
Press DAY and set the day.
Each time the DAY is pressed, the DAY display is changed in the following manner.

SUN → MON → TUE → WED → THU → FRI → SAT

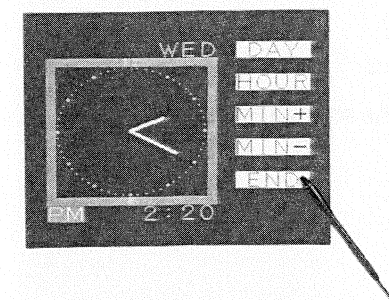
If the light pen is kept pressing against DAY, the display will keep on changing (in this case, the short confirmation tone, "beep," will sound only in the beginning).



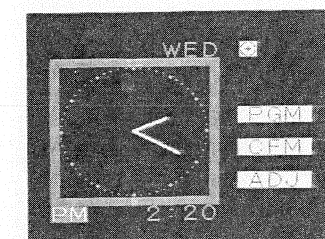
Press HOUR to set the hour.
Both the analog display and digital display will advance in one-hour increments.



Press MIN+ or MIN- to set the minute.
When MIN+ is pressed, the display advances in one-minute increments (0 → 1 → 2 → 3 → ...).
When MIN- is pressed, the display regresses in one-minute increments (59 → 58 → 57 → ...).



Press END (you may want to push time report at the same time).



The clock will begin to move.
(The red second hand should move first)
The present time is now set.

The screen will change to the CLOCK & MENU screen.

NOTES:

- In setting the time, if the VCR's TIMER SCREEN button is pressed without pressing END, the screen will return to showing the TV program; however, the time setting mode is not cancelled, and the VCR's timer display section will flash and the clock will not move. In this case, press the VCR's CLOCK SET button at the same time the Time Report, etc., is pressed. At the same time the clock starts to move from 0 second, the timer display's light will cease to flash.
- If the TIMER SCREEN button is repeatedly pressed a few times, the number of times the button has been pressed is stored in the memory. Therefore, the screen display may not change or the screen may not return to show TV programs. Press the TIMER SCREEN button slowly and once at a time.
- In the TIMER SCREEN mode, pressing any of the PLAY, REC, or TV STILL will cancel the TIMER SCREEN mode.

How to Set the Timer

Set the timer reservation in the following order:

PGM NO → DAY → CH → ON Time (HOUR) → ON Time (MIN) → Tape Speed → END Time (HOUR) → END Time (MIN)

Types of recording date are as follows:

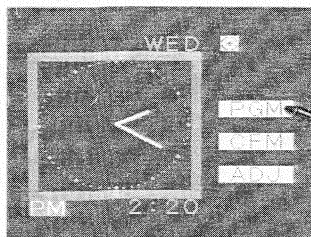
Specified day in the first week, specified day in the second week, same day of every weekly, weekdays (MON-FRI), and everyday.

If the present day is Wednesday, the first week is that Wednesday through to Tuesday.

The second week is from the following Wednesday through to the next Tuesday.

The explanation here uses the example of setting the timer for Program 2, SP Mode, on Channel 28, from 7:30 p.m. to 8:50 p.m. on the 2nd Wednesday (We will suppose the present time to be Wednesday, 2:20 p.m.)

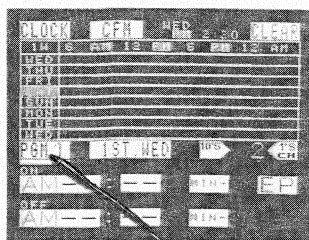
1. Press PGM.



CLOCK & MENU SCREEN

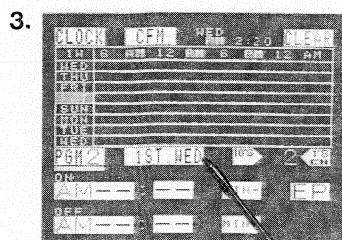
The screen is changed to the RESERVATION SCREEN mode.

2. The calendar will always first display the current day. Since the example day is Wednesday, the uppermost row of the calendar is displaying WED.



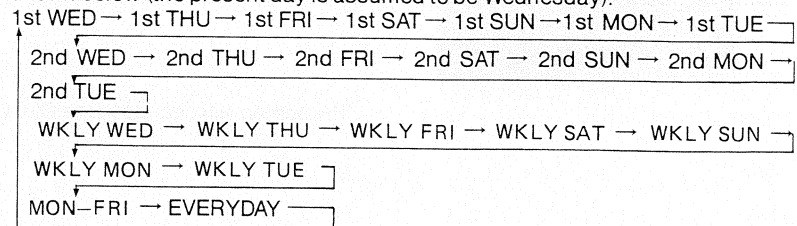
Press PGM 1 once to change to PGM 2.

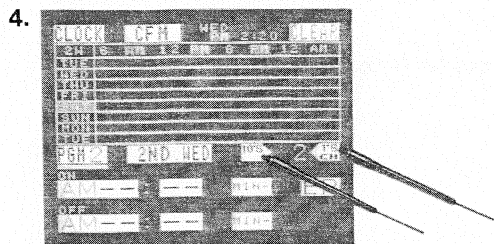
(Pressing it twice changes the mode to PGM 3; three times to PGM 4; and four times to return to PGM 1.)



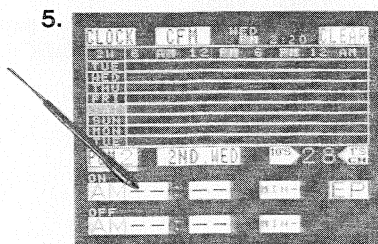
Press 1st WED to change it to 2nd WED.

By continuously pressing the area for day setting, the display will change as shown below (the present day is assumed to be Wednesday).

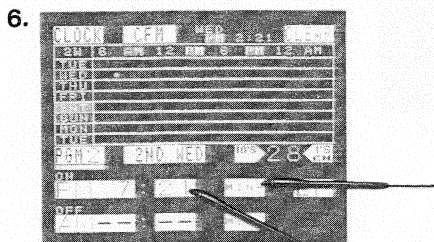




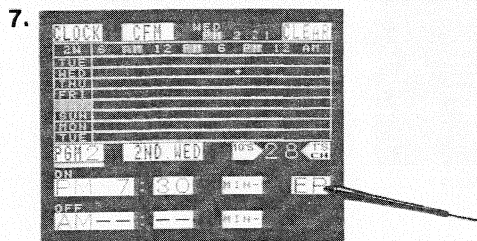
Press 10's and 1's to set the channel.
Press 10's twice to set the tens to 2, and press 1's six times to set the ones to 8 to set channel 28.



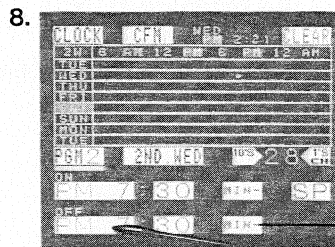
Press "ON AM--" to set the PROGRAM TIMER's starting time.
Pressing it once displays the present time (2 P.M. in the example).
After the PM2 is displayed, press five more times to set it to PM7.



Press MIN cursor or MIN-- to set the starting time's minute "30".

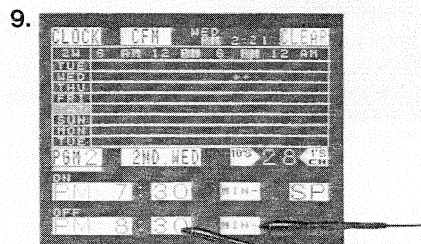


Press EP to set the tape speed to SP (EP and SP are alternately displayed when this area is pressed).

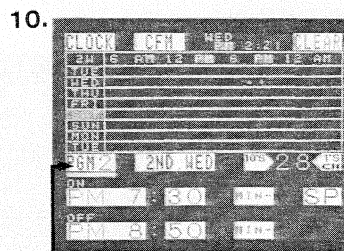


Press "OFF AM--" to set the ending hour of the program timer, "PM8".

Starting time is initialized.



Press MIN cursor or MIN-- to set the ending minute "50".



The timer reservation periods are graphically displayed on the calendar.

Colors are displayed under the reservation numbers.

Reservation 1	Reservation 2	Reservation 3	Reservation 4
Yellow	Pink	Green	Sky blue

Press PGM2 again.

The PGM2 display will change to PGM3 display.
The program timer reservation is now completed.

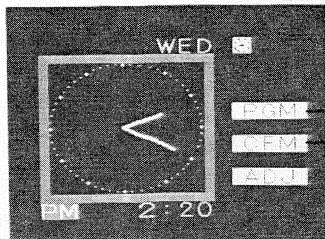
If you wish to make recording settings for the remaining three program numbers, repeat the above method.

After timer reservation process has been completed, press the OSP button ④ on the VCR unit.
The TV screen will return to showing normal TV programs. Install a cassette in the VCR and press the Timer button ⑤ on the VCR.
The timer is set in the recording standby mode, and the recording will be automatically started at the reserved time.

If nothing is inputted in the RESERVATION SCREEN mode for one minute, the screen will automatically change to the CLOCK & MENU screen.

Revising, Cancelling and Confirming the Program

First, press the OSP button ④ and call the CLOCK & MENU screen to the TV screen.



CLOCK & MENU SCREEN

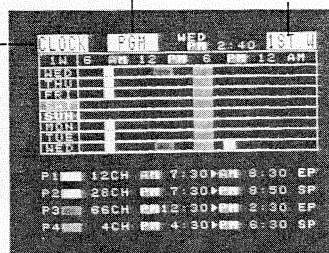
Confirming the reservation contents.
Pressing CFM will change the screen to the CONFIRM screen.

Revising or cancelling the reservation contents.
Press PGM to change the screen to the RESERVATION SCREEN.

By pressing "1st W" once more, the screen will change to the 2nd week CONFIRM SCREEN.

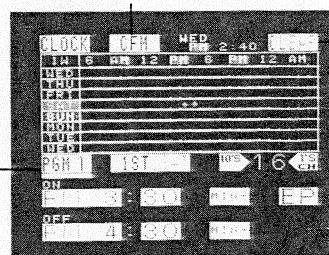
Press PGM to change the screen to the RESERVATION SCREEN.

Press CLOCK to return to the CLOCK & MENU SCREEN.



CONFIRM SCREEN/1st Week

Press CFM and change it to the CONFIRM screen.



RESERVATION SCREEN

CLEAR

Cancellation

1. Press PGM1 and set the program number you wish to cancel.
2. Press CLEAR.

Revision

1. Press PGM1 and set the program number you wish to revise.
2. Press the appropriate areas to make the necessary revisions.

By pressing the VCR's OSP button once, the first week's CONFIRM screen will appear. By pressing the button twice, the second week's CONFIRM screen will appear. By pressing the button three times, the screen will return to show the TV program.

NOTES

Instead of pressing "1st W" and "2nd W" with the light pen, the CONFIRM SCREEN may be called with the remote control and the VCR unit's OSP button as well. By pressing the OSP button once after the CLOCK &

MENU SCREEN the screen changes to the 1st week CONFIRM SCREEN. By pressing it twice, the 2nd week CONFIRM SCREEN will appear. By pressing it once more, the normal TV program will appear.

NOTES

- Press the light pen perpendicular to the screen. If the light pen is pressed diagonally to the screen, a wrong mode may be activated.
- The light pen may not function properly if the TV screen is dirty or the screen is extremely dark.
- Operate the TIMER SCREEN in the STOP mode.
It will not function during recording, playback, or TV still picture mode.
- When using the light pen, first press it against the TV screen's starting position, ⊕. If the TV is changed, correct the pen position after placing it against the screen display's ⊕ position.
- Video timer display will display ≡≡≡ when the unit's in the TIMER SCREEN mode, and the VCR's TIMER function buttons will not function.
- When you use a double scanning TV set, set the TV select switch on the back of the VCR to the double scanning side.

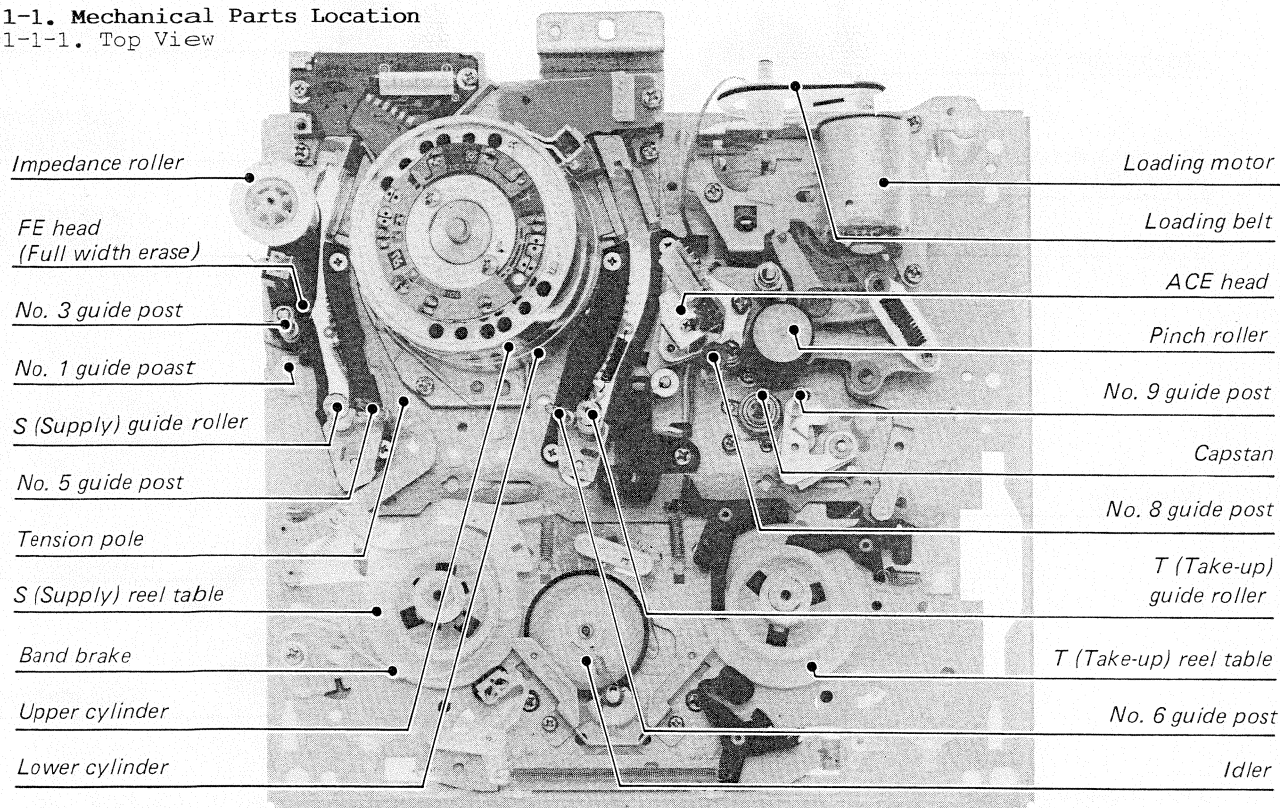
SECTION 2

ADJUSTMENT PROCEDURES

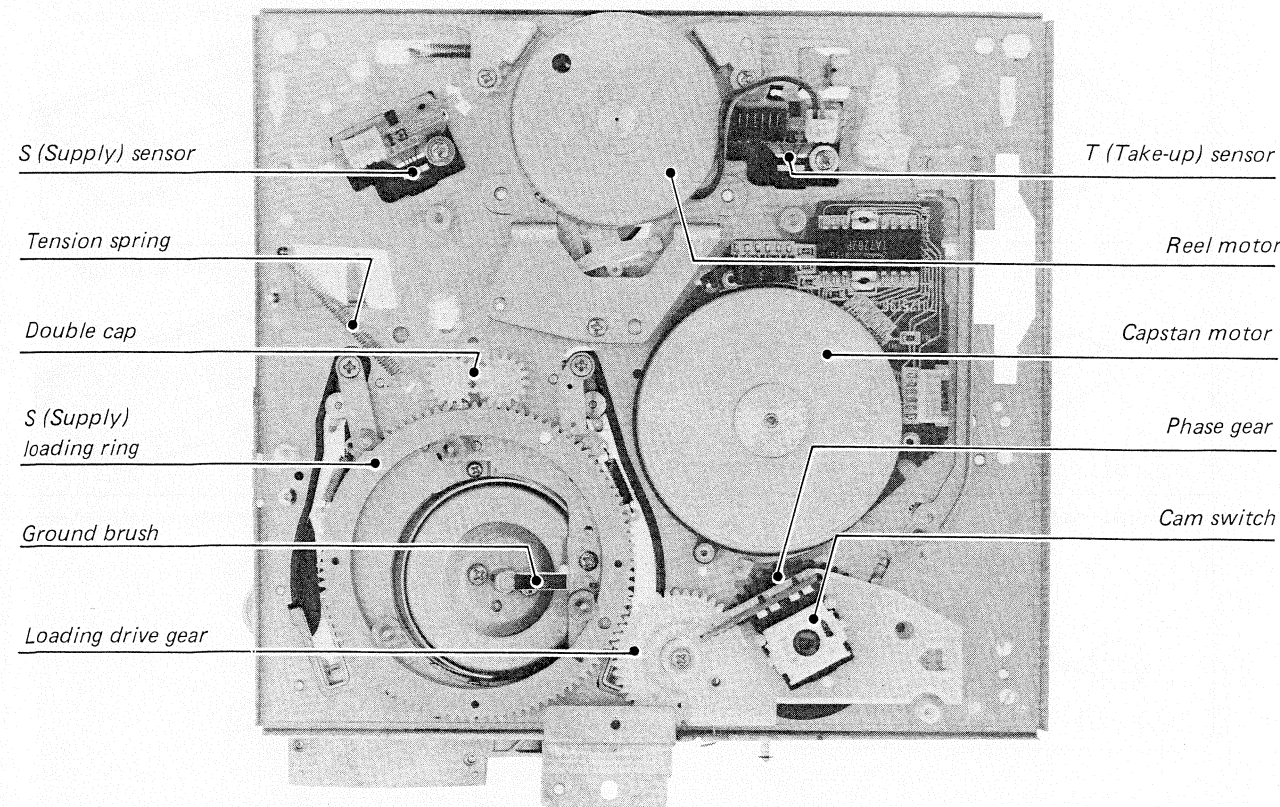
1. MECHANICAL ADJUSTMENT

1-1. Mechanical Parts Location

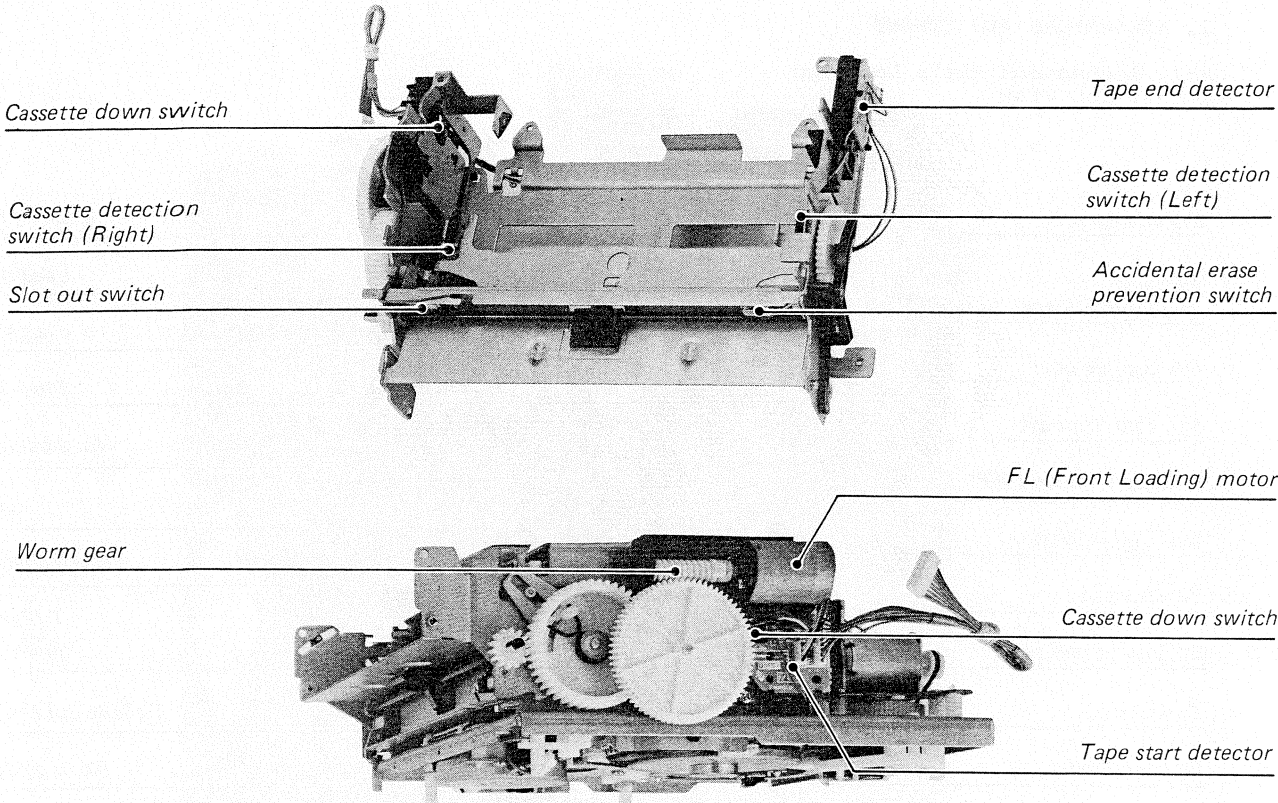
1-1-1. Top View



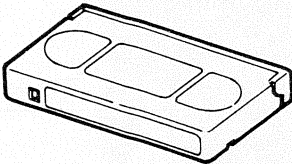
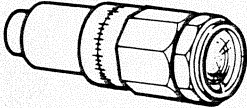
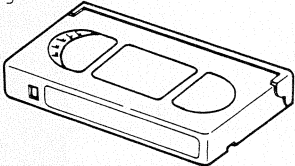
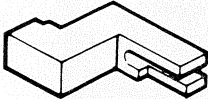
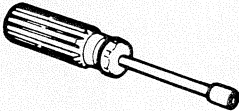
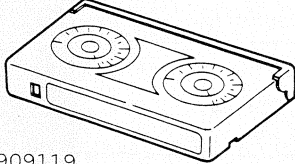
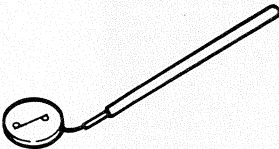
1-1-2. Bottom View



1-1-3. Front Loading Mechanism



1-2. Servicing Jig List

<p>Alignment tape ST-N1: 70909202 ST-NF: 70909203</p> 	<p>Torque gauge</p>  <p>70909098</p>	<p>Back tension cassette gauge</p>  <p>70909103</p>
<p>Height gauge</p>  <p>70909113</p>	<p>Taper nut driver</p>  <p>70909162</p>	<p>Torque cassette gauge (KT-300NR)</p>  <p>70909119</p>
<p>Dental mirror</p>  <p>70954003</p>	<p>MH-1 (70909110) or MH-1L (70909111) can be used instead of alignment tape ST-N1.</p>	

1-3. Main Parts Replacement

1-3-1. Front Loading

(1) Front loading assembly <Replacement>

1. Disconnect the relay cable connector from the Logic P.C. board.
2. Loosen 2 mounting screws on the deck top shield plate, and remove the shield plate.
3. Remove 2 screws securing the front loading assembly on the base.
4. First, pull the front loading assembly forward, unhook claws from the holes on the main base, and then take out the loading assembly upward, and replace it.

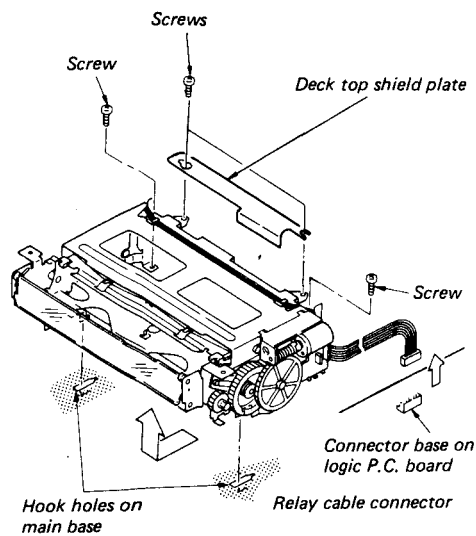


Fig. 1-3-1 Front loading assembly replacement

(2) Door <Replacement>

1. Make sure the cassette holder is in the cassette eject position.
2. Turn the cassette door until the left door shaft matches its receptacle of the door bracket, and then slide the door rightward.
3. Warp the door forward at its center and disengage the left side of the door from the door bracket. Move the door left side to remove it.
4. Remove a door spring from the right door shaft and replace it. Apply slight amount of grease on both shafts of the door to replace.

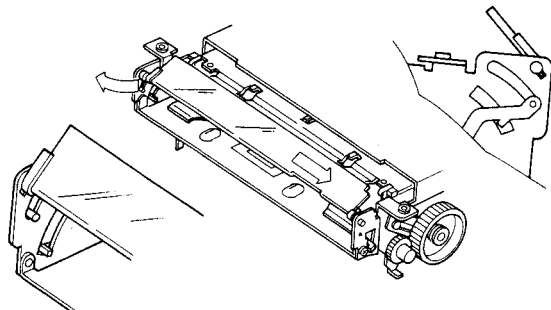


Fig. 1-3-2 Door replacement (1)

5. Insert the door spring into the right door shaft of the new door.
6. Insert the tip of door spring into the spring hook (hole) on the guide bracket, and insert the right door shaft into the guide bracket.

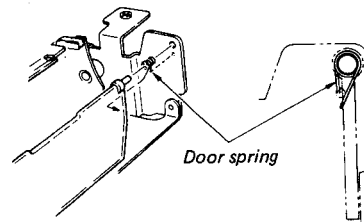


Fig. 1-3-3 Door replacement (2)

7. Insert the left door shaft into the guide bracket while warping the door slightly forward. In this case, make sure that the door lever pin is positioned as shown in Fig. 1-3-4.

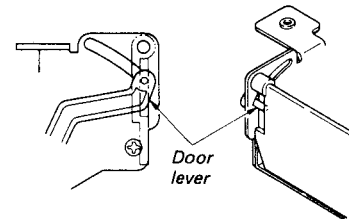


Fig. 1-3-4 Door replacement (3)

(3) Cassette detection switches, L, R <Replacement>

1. Remove the front loading assembly from the chassis.
2. Place the front loading assembly upside down.
3. Unsolder leads from the switch terminals using a soldering iron. In this case, the unsoldering work will be made easily if the cassette holder is moved down by rotating the coupling section of the worm gear and the motor. (Do not touch your hand to gear teeth.)
4. Remove screws securing the switches and replace the switches.
5. When mounting new switches, perform the above previous steps in reverse order.

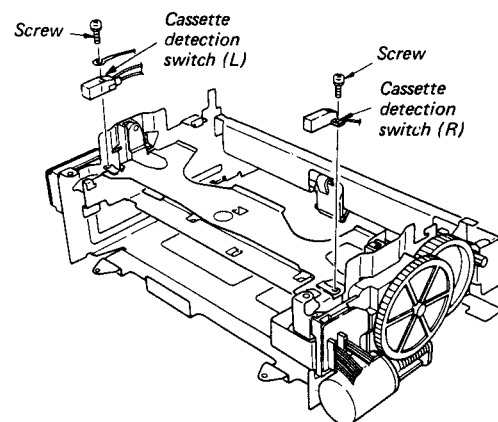


Fig. 1-3-5 Replacement of cassette detector

(4) Cassette down switch

<Replacement>

1. Remove the front loading assembly from the chassis.
2. Remove the FL P.C. board (R) unhooking the mold claws on the guide R.
3. Remove the screw securing the switch and take out the switch.
4. Unsolder the leads from the switch terminals using a soldering iron.
5. When remounting a new switch, perform the previous steps in reverse order.

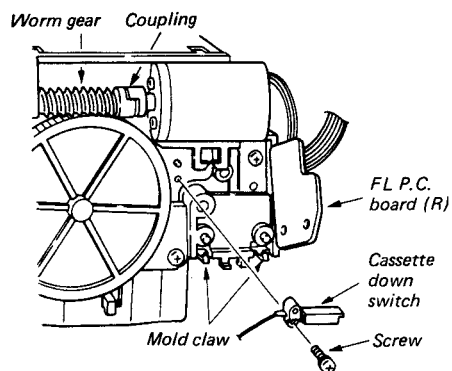


Fig. 1-3-6 Cassette down switch replacement

(5) Slot out switch and accidental erase prevention switch

1. Remove the front loading assembly from the chassis.
2. Place the loading assembly with the door facing upward.
3. Unsolder the leads from the switch terminals, using the soldering iron.
4. Remove the screw securing the switch.
5. When mounting the switch, perform the previous steps in reverse order.

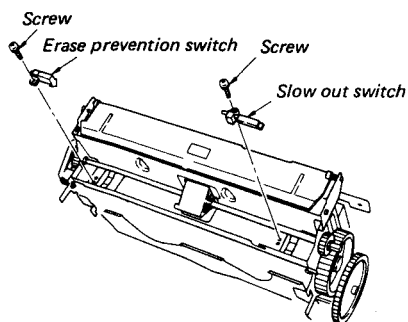


Fig. 1-3-7 Replacement of slot out switch and erase prevention switch

(6) FL motor assembly

<Replacement>

1. Remove the front loading assembly from the chassis.
2. Unsolder the leads from the motor terminals, using the soldering iron.
3. Remove the screws securing the FL motor assembly on the guide R and remove the assembly.

4. When mounting the assembly, perform the previous steps in reverse order.

Note:

When replacing the FL motor, always use a motor with a label in green letters. Do not use any other motor.

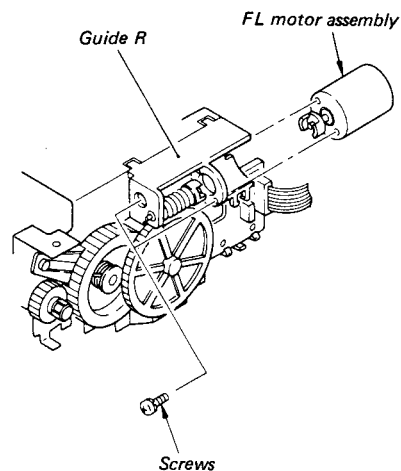


Fig. 1-3-8 Replacement of motor assembly

(7) Photo transistor

<Replacement>

1. Remove the front loading assembly from the chassis.
2. Remove the FL P.C. board (R) unhooking the mold claws on the guide R.
3. Unsolder the photo transistor from the FL P.C. board, using the soldering iron.

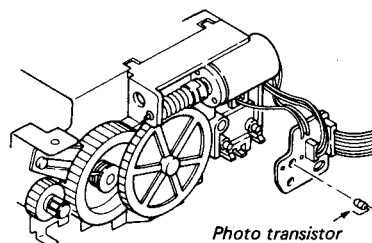


Fig. 1-3-9 Replacement photo transistor on FL P.C. board (R)

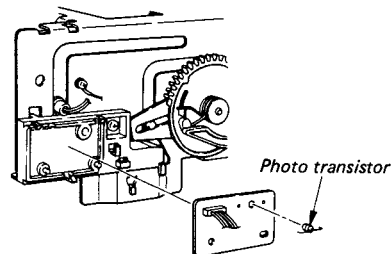


Fig. 1-3-10 Replacement of photo transistor on FL P.C. board (L)

4. Bend leads of a new photo transistor as shown in Fig. 1-3-11.
5. When remounting the transistor, perform the previous steps in reverse order.
6. The replacement method will apply to both the photo transistors on the left and right FL P.C. boards.

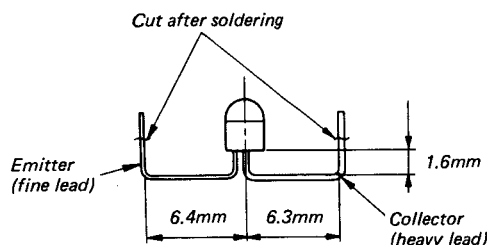


Fig. 1-3-11 Forming of photo transistor leads

1-3-2. Cylinder

(1) Upper cylinder assembly

<Inspection>

1. Check if video heads are damaged or worn out.
2. Check video heads clogging.
(Replace the upper cylinder assembly if the clogging is not remedied after cleaning.)

<Replacement>

1. Unsolder the relay terminals (at the marks W, 2 pairs - in total 4 locations) on the head relay P.C. board. The solder will be removed easily using a desoldering wire (Fig. 1-3-12/1-3-13).
2. Remove two screws (A) and remove the upper cylinder assembly.
3. Clean a new upper cylinder assembly and the surface of the flange before mounting, using a cleaning kit.
4. Align phases of the white part of Head relay P.C. board and Rotary transformer (A) P.C. board and then mount the upper cylinder.
(Tightening torque; 3 - 4kg-cm.)
5. Perform the tape transport adjustment.

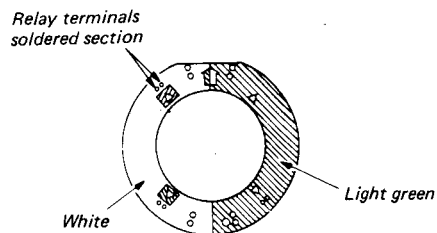


Fig. 1-3-12 Head relay P.C. board

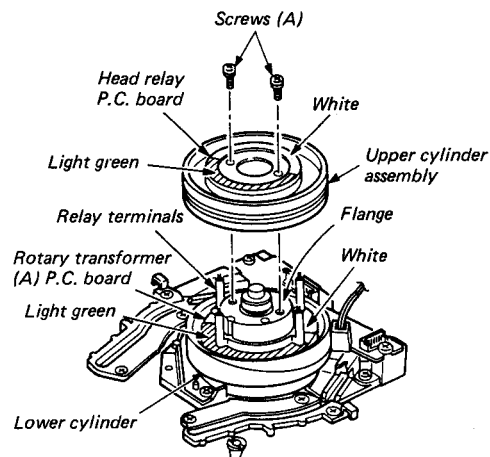


Fig. 1-3-13 Upper cylinder replacement

(2) Cylinder motor

<Inspection>

1. Apply power to the cylinder motor separately.
2. If the motor does not rotate, replace the rotor or the stator.

<Rotor replacement>

1. Remove the ground cap.
2. Remove two rotor screws and replace the rotor.
(Tightening torque; 3 - 4kg-cm.)

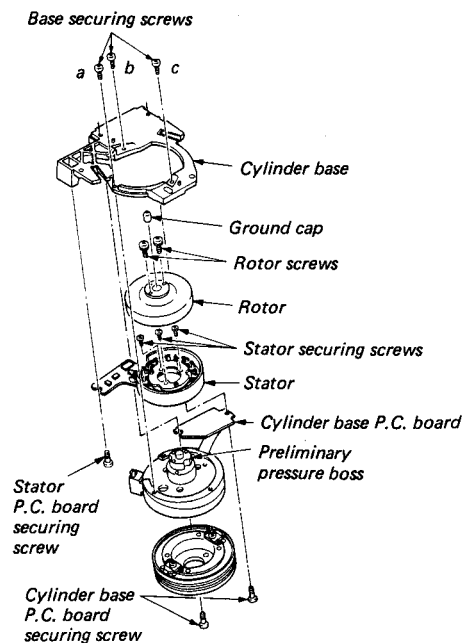


Fig. 1-3-14 Cylinder motor replacement

Note:

Mount a new rotor, matching the phase decision holes of rotor and preliminary pressure boss. (Fig. 1-3-14, 15)

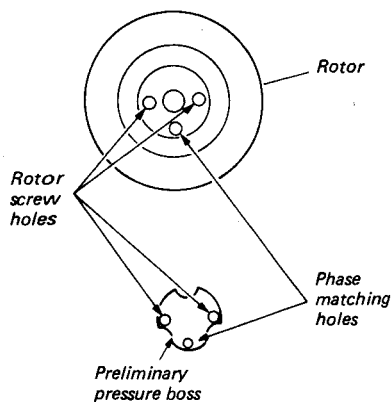


Fig. 1-3-15 Phase matching between rotor and preliminary pressure boss

<Stator replacement>

1. Remove the cylinder assembly. (Refer to 1-3-2(3))
2. Remove two cylinder base P.C. board securing screws and stator P.C. board securing screw (Fig. 1-3-16).

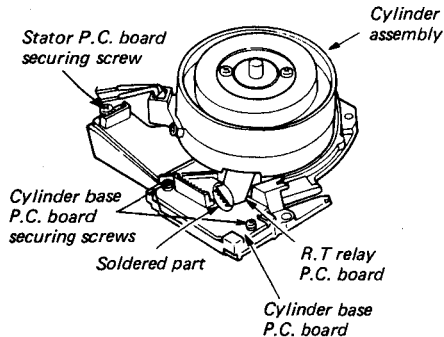


Fig. 1-3-16 Relay P.C. board and cylinder base P.C. board

Note:

In this case, take care not to damage patterns of the R.T relay P.C. board. Also handle the cylinder base P.C. board carefully so that the cylinder is not damaged with the P.C. board.

3. Remove three base securing screws and remove the cylinder base. (Fig. 1-3-14)
4. Remove the rotor screws and the rotor. (Fig. 1-3-14)

Note:

Follow the procedures under "<Rotor replacement>".

5. Remove the stator securing screws.
6. Pull out the stator and replace it. (Tightening torque 1.5 - 2.5 kg-cm)
7. When mounting the cylinder assembly, perform the previous steps in reverse order.

Note:

Sequence of tightening base securing screws: tighten the screw a first, b and c in any order. (Tightening torque is 3 - 4 kg-cm.) (Fig. 1-3-14)

8. Perform the tape transport adjustment.

(3) Cylinder assembly**<Inspection>**

1. Check to see that rotating surface of the lower cylinder has no damage such as scratches, cracks, etc.
2. Check to see smooth rotation of the upper cylinder. If abnormality is found, replace the cylinder(s).

<Replacement>

1. Remove the Pre Amp P.C. board, 6P connector (Hi-Fi audio head), 6P connector (cylinder motor), and the dew heater.
2. Remove three screws (A).
3. Remove the cylinder assembly.

Note:

In this case, move the impedance roller in direction shown by the arrow.

4. Align position of a new cylinder to the cylinder base, taking care not to touch the video heads directly and not to damage the cylinder surface. When mounting the cylinder assembly, perform the previous steps in reverse order.
5. Perform the tape transport adjustment.

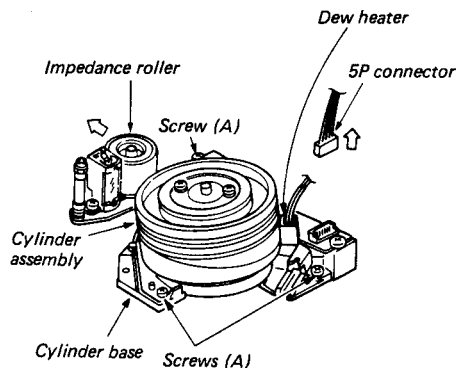


Fig. 1-3-17 Cylinder assembly replacement

1-3-3. Transport System Parts Replacement

(1) ACE head assembly replacement

1. Disconnect a 6P connector from the ACE P.C. board.
2. Turn the ACE height adjusting nut counterclockwise and remove the nut in order to remove ACE base assembly. (Fig. 1-3-18)

Note:

Note positions of the ACE base and the taper nut.

3. Remove the E-ring and the ACE azimuth adjusting screws in order to remove the ACE head assembly.
4. Remove the ACE P.C. board from the ACE head assembly.
5. Replace the ACE head assembly, according to the reverse procedures.
6. Rotate the ACE height adjustment nut until the ACE base and the upper position of the taper nut have the same position as noted in the step 2.
7. After mounting, perform the tape transport adjustment, starting from the first step.

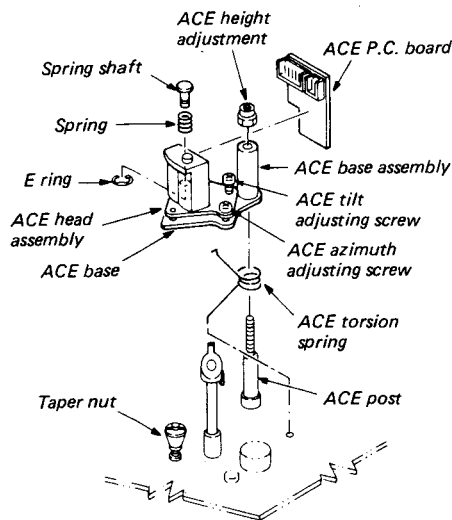


Fig. 1-3-18 Replacement of ACE head assembly

Note:

- * Since direct mounting of the ACE torsion spring is difficult, first insert the tip of the spring into the hole on the main base and then hook the opposite tip of the spring to the ACE base which has been inserted into the ACE post.
- * When replacing the ACE head assembly, always use an ACE head with a green label. Do not use any other ACE head assembly.

(2) Guide sleeve replacement

<No. 3 guide sleeve replacement>

1. Rotate the No. 3 guide nut counterclockwise and remove the No. 3 guide nut and flange as shown in Fig. 1-3-21. When replacing a new flange, perform the previous steps in reverse order.
2. After the replacement, preset height of the lower flange as shown in Fig. 1-3-19, using the guide height gauge.
3. After completion of preset, perform adjustments by following the procedures for Linearity Adjustment, item 4) of the Tape Transport Adjustment. (Refer to 1-4-4 (3).)

Note:

The flange arranged in upper and lower positions are common parts and can be used either place and upside down. (Fig. 1-3-21)

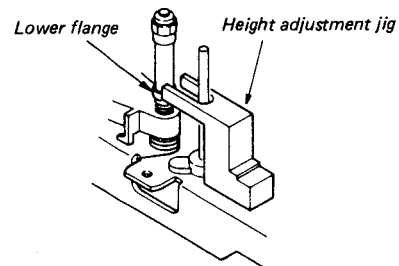


Fig. 1-3-19 No. 3 guide preset

<No. 8 guide sleeve replacement>

1. Remove No. 8 cap through the No. 8 lower flange in this sequence as shown in Fig. 1-3-20. When reassembling, perform the previous steps in reverse order.

Note:

When mounting the No. 8 guide cap, mount it with its slant surface facing to the cassette side.

2. After completion of this replacements, perform adjustments by following the procedures for the linearity adjustment, item 4) of the transport adjustment. (Refer to 1-4-4 (3))

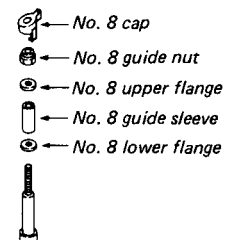


Fig. 1-3-20 No. 8 guide replacement

(3) FE head replacement

1. Disconnect the 2P connector of the FE head.
2. Remove the FE head mounting screw and the FE head can be removed. (Fig. 1-3-21)
3. Replace the new FE head and tighten the FE head mounting screw.
4. Connect 2P connector.
5. The replacement of the FE head causes little change in linearity. But confirm whether the associated adjustments have not been upset, starting check from the linearity adjustment, item 4) of the tape transport adjustment. (Refer to 1-4-4 (3).)

(4) Impedance roller replacement

1. Remove the washer and replace the impedance roller as shown in Fig. 1-3-21.

Note:

The polyslider must be inserted between the impedance roller and the entrance lever, take care not to miss it. An impedance roller with scratches may damage the tape, so handle it carefully. If your fingers touch the surface of the impedance roller, clean the surface with alcohol.

2. After replacement of the impedance roller, perform the adjustment from the linearity adjustment, item 4) in the tape transport adjustment. (Refer to 1-4-4 (3).)

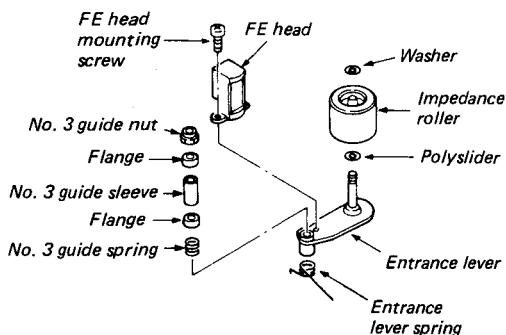


Fig. 1-3-21 Replacement of No. 3 guide and FE head

(5) S, T-guide rollers replacement

The same replacement procedures will be applied for both S and T-guide rollers.

1. Loosen the set screw shown in Fig. 1-3-22.
2. Turn the guide roller counterclockwise and remove it.
3. As the O-ring may stick to the guide roller when removed, remove the O-ring and install it on the new guide roller.
4. When remounting, perform the previous steps in reverse order.

Note:

When tightening the set screw, temporarily tighten it with light pressure. If it is tightened too hard, associated adjustments can not be made.

The S-guide roller has a red mark on upper flange and the T-guide roller has a black mark on upper flange. Do not exchange them when remounting.

5. After completion of the replacement, perform adjustment from the linearity adjustment item 4) in the tape transport adjustment. (Refer to 1-4-4 (3).)

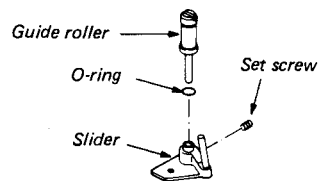


Fig. 1-3-22 Guide roller replacement

(6) S, T-sliders replacement

1. Remove the cylinder assembly.
2. Place the VCR vertically and remove the bottom cover.
3. Remove the connecting screw shown in Fig. 1-3-23.

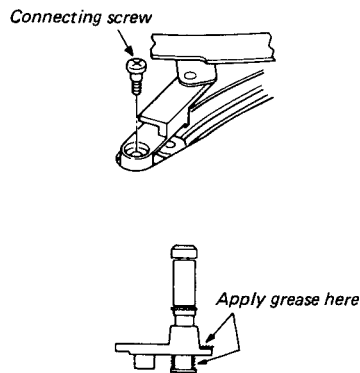


Fig. 1-3-23 S, T-slider replacement

4. Move the slider up to the loading position turning loading motor with your hand, and the slider can be removed.
5. Remove the guide roller and reinstall it in a new slider according to the steps stated in (5).
6. When replacing the slider, perform the previous steps in reverse order.
7. After completion of the replacement, perform adjustment from tape transport system adjustment. (Refer to 1-4-4 (3)).

Note:

When the slider is replaced, always apply grease to the slider as shown in Fig. 1-3-23.

(7) No. 9 guide lever assembly replacement

1. Remove the washer shown in Fig. 1-3-24.
2. Remove No. 9 guide lever assembly shown in Fig. 1-3-24.
3. When replacing, perform the previous step in reverse order.

Note:

When mounting the No. 9 guide lever assembly, temporarily hook section A of No. 9 guide spring at the cutout on No. 9 guide lever and then insert the guide lever assembly into the pin. Then unhook the section A from the cutout.

4. After completion of the replacement, perform adjustment from the item 6) in the tape transport adjustment. (Refer to 1-4-4 (3)).

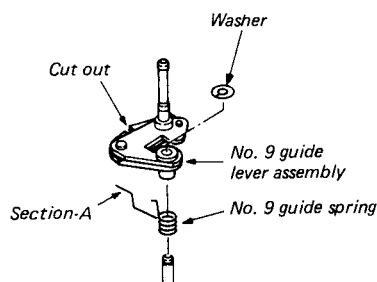


Fig. 1-3-24 No. 9 guide lever replacement

1-3-4. Pinch Roller Assembly Replacement

1. Remove the washer (A) and disconnect the pinch connector from the pinch roller assembly.
2. Remove the washer (B) and remove the pinch roller assembly upward.
3. Clean the pinch post and apply grease on it.
4. Replace the pinch roller assembly according to the previous steps in reverse order.
5. After completion of the replacement, perform adjustment from the item "1-4-4 (3) Tape transport system adjustment".

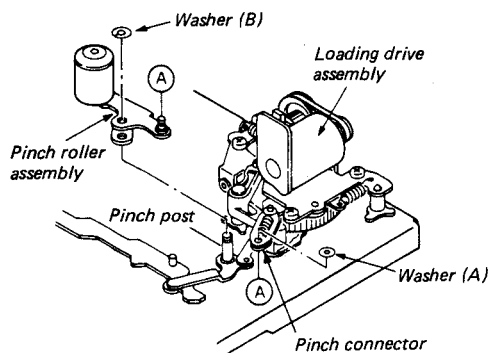


Fig. 1-3-25 Pinch roller replacement

1-3-5. Loading Motor Replacement

1. Remove the motor P.C. board from the motor, taking care not to damage wire leads.
 2. Remove the washer (A) and disconnect the pinch connector.
 3. Remove the cam lever stopper and the washer (B), and remove the cam lever assembly upward.
 4. Turn the gear pulley in direction shown by the arrow until it stops to set the FF/REW mode. (Fig. 1-3-27)
 5. Remove the screws (A) and remove the loading drive assembly.
 6. Remove the loading belt and the screws (B), and remove the motor.
 7. Replace the motor.
- When replacing with a new motor, perform the previous steps in reverse order, taking care of polarities (+ polarity should be located on upside).
8. When mounting the loading drive assembly on the main base, first push the logic slider rightward (shown by the arrow) until it stops, and then mount the drive assembly.
 9. Confirm timing of the phase gear, referring to the item 1-4-1.

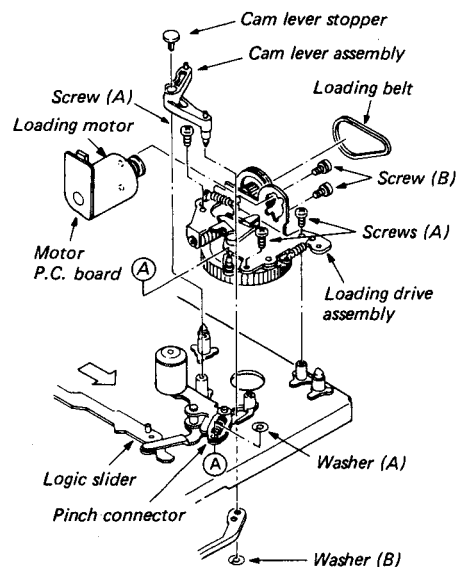


Fig. 1-3-26 Loading motor replacement

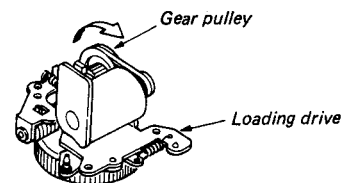


Fig. 1-3-27 Loading drive . FF mode

Note:

When replacing the loading motor always use a loading motor with a label in green letters. Do not use any other motor.

1-3-6. Band Brake Assembly Replacement

1. Remove the S-soft brake assembly.
2. Remove a tension spring from a tension lever.
3. Remove the screw and remove the tension lever and the band brake assembly from the main base.
4. Remove the band brake assembly from the tension lever and replace the band brake assembly.
5. Clean the shaft of the tension lever and then apply one or two drops of oil. When replacing with a new band brake assembly, perform the previous steps in reverse order.
6. After completion of the replacement, check position of the tension pole and its adjustment (refer to item 1-4-2) and check the backtension (refer to item 1-4-3).

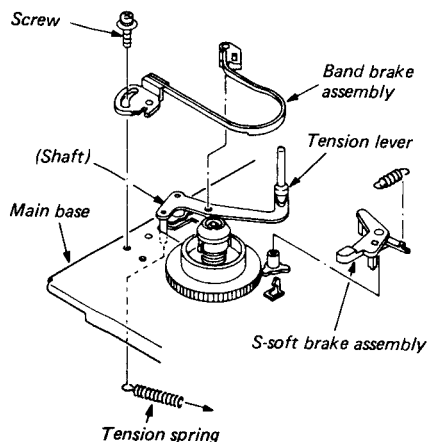


Fig. 1-3-28 Band brake assembly replacement

1-3-7. Cam Switch Replacement

1. Remove the screw and the cam switch bracket.
2. To remove the cam switch, move it upward with a screwdriver while opening the claw of the cam switch bracket.
3. Perform the phase matching adjustment (timing check), referring to the item 1-4-1.
4. Replace the cam switch and mount it on the cam switch bracket.
5. When mounting the cam switch on the phase gear shaft, mount the cam switch while pushing the external rim of the cam switch in the direction shown by the arrow.
(If the hole D of the cam switch and the cutout D of the phase gear shaft are not matched (overlapped), turn the cam switch until the hole D matches.)

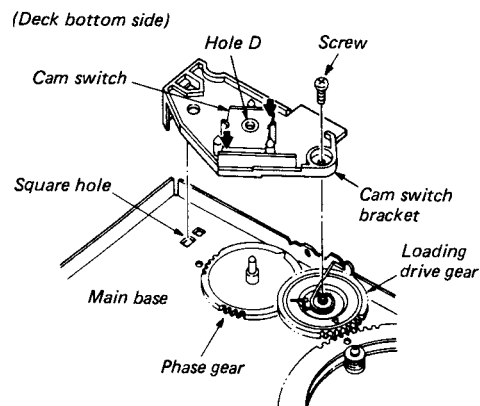


Fig. 1-3-29 Cam switch replacement

1-3-8. T, S-Sensor Assemblies Replacement

1. Disconnect 3P and 6P connectors in T-sensor assembly, and 4P connector in S-sensor assembly.
2. Remove the screws.
3. Remove the sensor assemblies.
4. When reinstalling a new sensor, perform the previous steps in the reverse order.

Note:

Since the Hall element is glued on the sensor holder, take care the hall element is not torn off during installation.

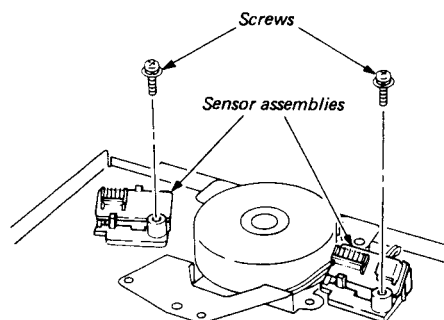


Fig. 1-3-30 Sensor assemblies replacement

1-3-9. Main Brake Assembly Replacement

1. The brake assembly has the mold claws which allow one touch installation or removal.

Note:

When replacing, take care not to touch the brake pad surface.

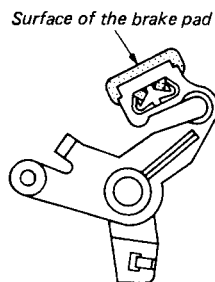


Fig. 1-3-31 Main brake assembly replacement

1-3-10. Ground Brush Replacement

1. Remove a screw and the brush.
 2. Clean the ground cap with alcohol.
 3. Replace the brush.
- Mount a new brush so that it can contact the center of the ground cap.

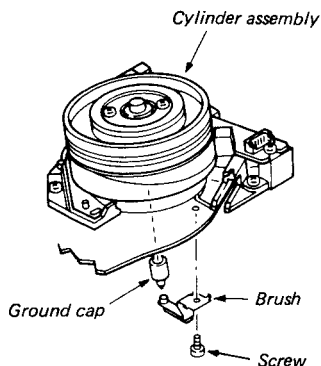


Fig. 1-3-32 Brush replacement

1-3-11. Reel Table Replacement

(1) Supply reel table assembly

1. Remove the S-soft brake spring from the S-soft brake. (Fig. 1-3-33)
2. Remove the S-soft brake.
3. Remove the tension spring from the tension lever.
4. Remove the screw (A), then remove the tension lever and the band brake assembly.

Note:

Take care not to damage the mold claw of the band brake.

5. Remove the washer (A), then remove the S-reel table assembly upward paying attention not to miss the spacers.

Note:

Move the S-brake assembly in the direction shown by the arrow before removing the reel table. Take care not to touch the pad surface of the S-brake. (Fig. 1-3-34)

6. After cleaning the reel shaft with a cleaning kit, lubricate it with one or two drops of oil (lubrication kit).
7. When reinstalling the S-reel table assembly, temporarily move the S-brake assembly in the direction shown by the arrow, using a tweezers. (Fig. 1-3-34)

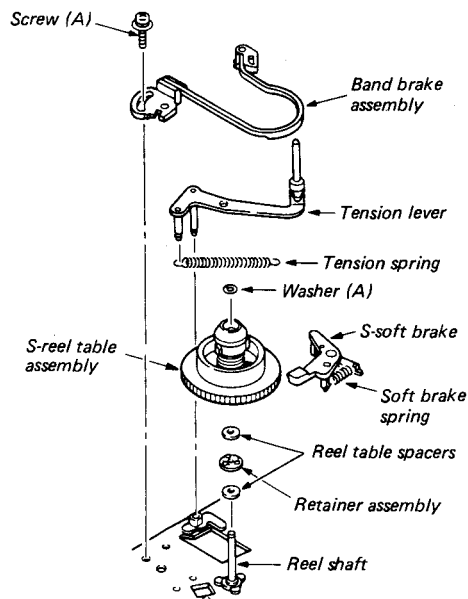


Fig. 1-3-33 Supply reel table assembly replacement

8. Replace the spacers and the retainer assembly on the reel shaft when mounting the reel table on the deck.
9. Mount the tension lever and band brake assembly.

Note:

The mold claw of the band brake can be engaged smoothly into the hole of tension lever by pushing it slightly. Take care not to deform the mold claw and the tension lever by forcing them.

10. Hook the tension spring onto the tension lever.

Note:

In this case, take care not to give permanent deformation to the spring.

11. Mount the S-soft brake.
12. Mount the soft brake spring.

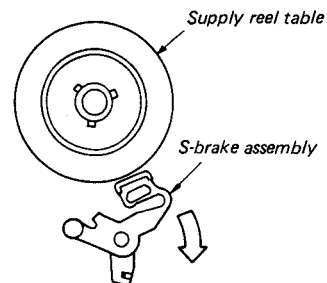


Fig. 1-3-34 S-brake assembly

(2) Take-up reel table assembly

1. Remove the reverse brake spring from the reverse brake assembly.
2. Remove the reverse brake assembly from the main base.
3. Remove the T-soft brake spring from T-soft brake assembly.
4. Remove the T-soft brake assembly from the main base.
5. Remove the washer (A), then move the T-brake assembly in the direction shown by the arrow before removing the T-reel table assembly. Take care not to touch the pad surface of T-brake assembly.
6. As the bearing is stained with oil, the reel table spacers and thrust washer may stick to the T-reel table assembly and be removed with it. Take care not to miss them.
7. Clean the reel shaft using a cleaning kit, and apply one or two drops of oil (lubrication kit) after the reel shaft has dried.
8. Replace the take-up reel with a new one.
9. When mounting the take-up reel table, move the T-brake assembly in the reverse direction shown by the arrow with tweezers.
10. Replace the spacers and the thrust washer on the reel shaft when the reel table mounts on the deck.

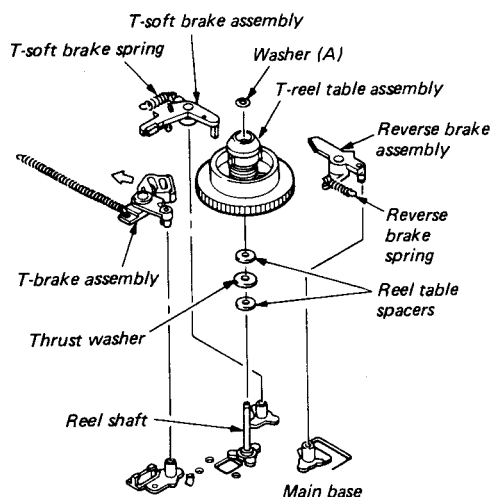


Fig. 1-3-35 Take-up reel table assembly replacement

1-3-12. Idler Assembly Replacement

Assume the front loading assembly is removed.

1. Removal of reel motor assembly (Fig. 1-3-36)
Turn over the set, and remove three screws (A) and screw (B). Disconnect the 3P connector of the reel motor from the T-sensor assembly. Move the idler assembly in the direction shown by the arrow, then lift the reel motor assembly upward to remove it.

After the reel motor was replaced, be sure to make adjustment of the reel torque referring to the item (2) in 1-4-3.

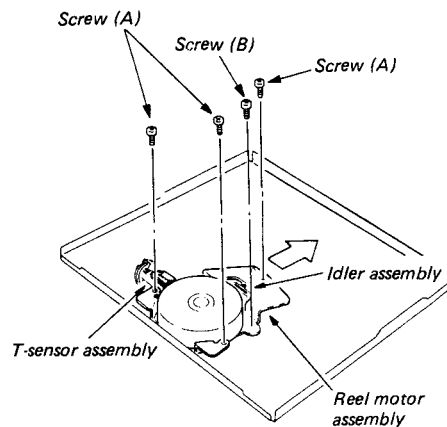


Fig. 1-3-36 Removal of reel motor assembly

Notes:

- * Before remounting, always clean knurling surface of the motor pulley, using the cleaning kit. This is to prevent oil, dust, etc. from sticking on surface of the idler rubber.
- * Screws (A) and (B) are different in length.

2. Removal of idle stop bracket. (Fig. 1-3-37).

Remove two screws (A), then remove the idle stop bracket.

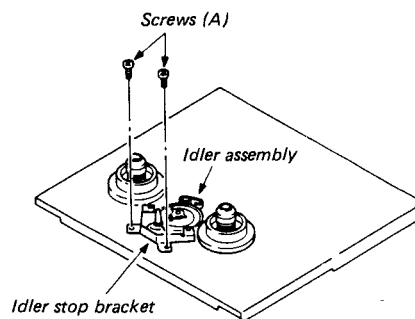


Fig. 1-3-37 Removal of idler stop bracket

3. Remove the T-reel table assembly as previously stated. (Refer to 1-3-11 (2)).
4. Remove the polyslider. (Fig. 1-3-38)
5. Remove the idle spring from the post.
6. Move the idler assembly in the direction as shown by the arrow. (Fig. 1-3-38).

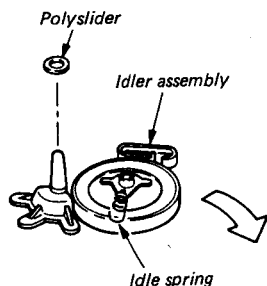


Fig. 1-3-38 Idler assembly replacement (1)

7. Confirm that the idler assembly is not caught with the main base. Lift the idler assembly upward.
8. When mounting, perform the previous steps in reverse order.
9. When mounting the idler assembly, be sure to grease. (Fig. 1-3-40)

Note:

Be sure to confirm that grease does not stain the rubber when the idler swings. Excessive amount of grease applied may stain the rubber.

10. Be sure to clean the idler rubber with the cleaning kit.

Note:

Make sure that the idler rubber is not stained with oil and dust. If stained, tape winding trouble may occur.

11. When assembling, perform the previous steps in reverse order. When the idler assembly was replaced, make sure to check reel torque adjustment referring to 1-4-3 (3).

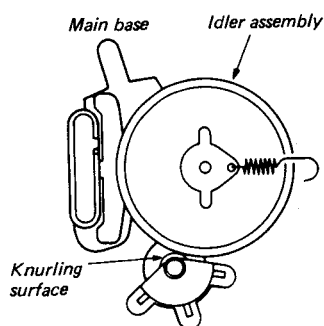


Fig. 1-3-39 Idler assembly replacement (2)

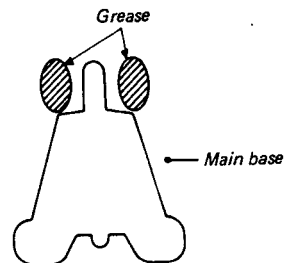


Fig. 1-3-40 Idler assembly replacement (3)

1-3-13. Capstan Motor Replacement

1. Remove the 6P connector from the capstan motor. (Fig. 1-3-41).
2. Remove the No. 9 guide lever assembly. (Refer to 1-3-3 (7))
3. Remove three screws and then the capstan motor. (Fig. 1-3-42)
4. Replace the capstan motor with a new one and mount it using the previous steps in reverse order.

Note:

After the capstan motor is replaced, check the tape transport system, referring to 1-4-4.

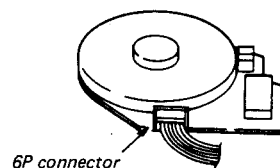


Fig. 1-3-41 Capstan motor replacement (1)

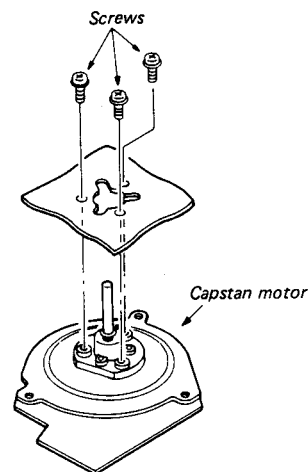


Fig. 1-3-42 Capstan motor replacement (2)

1-4. Check and Adjustment

1-4-1. Timing Check

(1) Cam gear and phase gear

1. Make sure the C-hole on the main base lines up with the holes on the cam gear and the loading drive base, if not, rotate the gear pulley assembly of the loading drive fully in the direction shown by the arrow to set FF mode. (Fig. 1-3-27)
2. Confirm the arrow mark of the phase gear is also aligned with the V-slot. If not aligned, adjust the timing by remounting the phase gear.

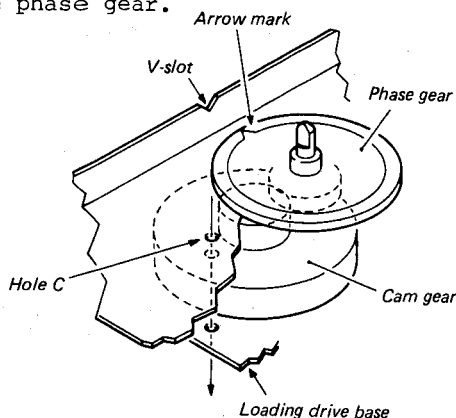


Fig. 1-4-1 Cam gear/phase gear

(2) Loading ring and loading drive gear

1. Make sure through the main base hole that holes of the S-loading ring and the T-loading ring are overlapped as shown by the arrow A. If they are not overlapped, adjust the location by removing the loading ring gear B.
2. Also make sure that the B-hole on the S-loading ring is coincided with the delta mark on the loading drive gear under the condition in the step 1 above. If they are not coincided, adjust the timing (location) by remounting the loading drive gear.

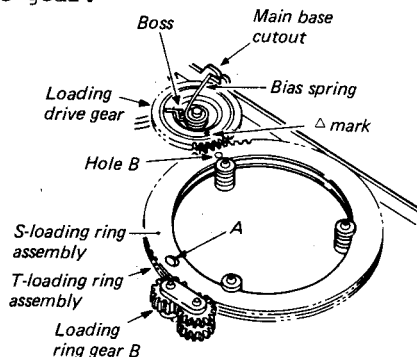


Fig. 1-4-2 Loading ring assembly/ loading drive gear

(When remounting the loading drive gear, make sure one end of the bias spring is hooked on the main base cutout and the other end is hooked on the boss of the loading drive gear.)

1-4-2. Check and Adjustment of Tension Pole Position

1. Set the deck to play mode with the front loading assembly removed.
2. Make sure the center of the tension pole is in alignment with the left edge of No. 1 guide post ($\pm 1\text{mm}$) as illustrated.
3. If necessary, loosen the screw (A) and adjust the mounting position of the band bracket.

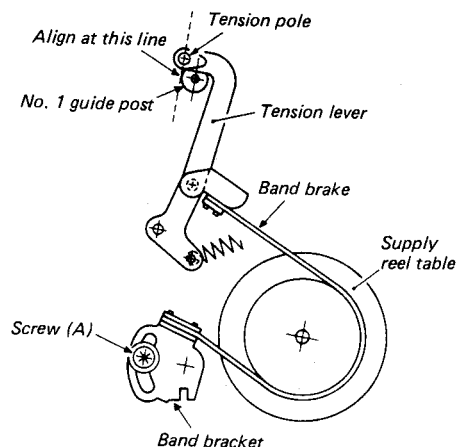


Fig. 1-4-3 Tension pole position

1-4-3. Reel Torque

(1) Reel torque

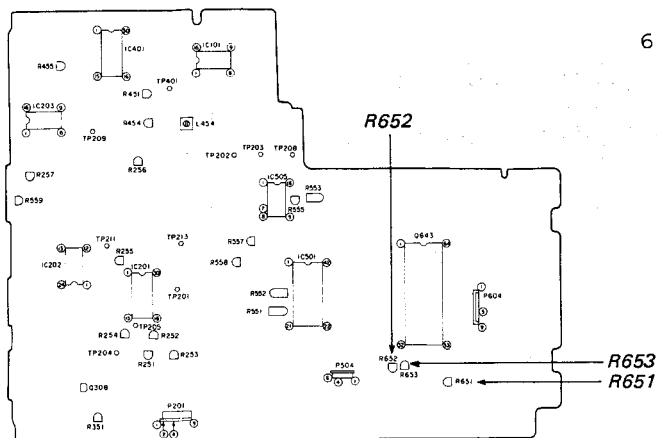
1. When REVIEW mode
Excessive torque will cause damage to the tape during REVIEW mode, while poor torque may not wind the tape.
2. Record/Playback (take-up side) mode
Too little torque does not rewind the tape to the end. If too large the tape may be stretched by excessive tension.
3. FF mode (take-up side)
REW mode (supply side)
Too little torque does not rewind the tape to the end or takes too much time for rewinding.
4. Inspection
Rewind the torque cassette to the end, then check the torque values shown below.
Record/Playback 70 - 90g-cm
FF/REW over 600g-cm
Reverse 190 \pm 10g-cm
Reverse 140 \pm 10g-cm

Notes:

- * If the reel torques are out of limits, clean the rubber surface of the idler assembly, the reel motor pulley, the reel table assembly, etc.
- * Replace the idler assembly, if its rubber is hardened or worn out.
- * Replace the brake pad of the main brake, if it is worn out.
- * If the specified torque value is not obtained, replace the reel idler assembly.

(2) Reel torque adjustment

1. First, record a TV broadcast program on the entire torque cassette tape (KT-300NR) in the EP mode.
2. Load a torque cassette in the VCR and rewind the tape before proceeding with measurement.
3. Set the VCR to the REVIEW mode and adjust R651 until the REVIEW take-up torque of 190 ± 5 g-cm is obtained while observing the left torque meter.
4. After completion of step 3, set the VCR to the PLAY mode.
In this case, push the STILL/PAUSE button as soon as the play mode has been set. Wait several seconds and then set the VCR to the PLAY mode again.
Read the right torque meter and adjust R652 so that the PLAY take-up torque of 80 ± 10 g-cm is obtained.
5. After completion of step 4, set the VCR to the REVERSE mode and perform the reverse torque adjustment.
Adjust R653 so that the right torque meter shows 140 ± 10 g-cm.
6. When the reel motor assembly or the idler assembly is replaced, perform confirmation and adjustment of the reel torque.
Perform the reel torque adjustment in the order of item 3, 4 and 5.
Torque value will change if the confirmation is performed in the reverse order.
If the torque(s) is out of limit in the above checks, adjust R651 again.
7. Confirmation and adjustment of the back tension will be performed with the front loading mechanism removed from the set and terminals 1 and 6 of P604 (Main P.C. Board) short-circuited, using a back tension cassette gauge.
First, make sure that the tension pole is positioned correctly by referring to (item 1-4-2).
Load a back tension cassette and set the VCR to the PLAY (SP) mode.
Make sure the meter is indicating 16 - 26 gf.cm.
If the value is out of limit, first make sure the tension level spring is normal, and then replace the band brake assembly as required. (Refer to item 1-3-6).



Main P.C. Board

PRECAUTIONS FOR USE OF TORQUE CASSETTE (KT-300NR)

1. Before loading a torque cassette in a VCR, always remove tape slack. The tape slack can be removed by rotating the reel to its take-up direction. (The tape tends to slack when there is no reel brake actions.)
2. When the torque cassette is slotted in, confirm followings:
 - a. Make sure the tape does not ride up or over the No. 8 cap. If it does, do not eject the tape but bring the tape to its correct position, taking care not to damage the tape.
 - b. Make sure the tape is not slackened, if slackened, operate the VCR in FF or REW mode and then stop the tape. Then make sure the tape is not slackened again.
 - c. After above confirmation, proceed to the reel torque adjustments and confirmation.
3. Cautions for removal of torque cassette
 - a. When removing the torque cassette from the VCR, set the VCR to the STOP mode and wait for several seconds. Then, make sure the tape is not slackened. Push the EJECT button to remove the cassette.
 - b. When removing the torque cassette from the VCR, also make sure the tape is not slackened inside the cassette lid before pulling the cassette from the VCR. If the tape is slackened inside the lid, carefully bring the tape in place and then pull the cassette.
4. Cautions for playback operation
 - a. When making adjustments and confirmation in the PLAY (EP) mode, first push the PLAY key, and then push STILL/PAUSE key to set the STILL mode. Run the VCR for several seconds in the STILL mode. Release the STILL mode and set the PLAY mode.
Then perform the reel torque adjustment and confirm all functions work properly.
5. If the previous precautions 1, 2, 3 and 4 are not performed properly, the tape may be damaged and correct measurement can not be performed.
6. Do not use worn out or damaged tape, if used they may damage video heads on the cylinder. In such a case always replace the tape with new one.
The replacement tape is of T-120 type, $6.01\text{m} \pm 0.3\text{m}$ in length.

1-4-4. Tape Transport System

The tape transport system has been precisely adjusted in the factory, so no check and alignment are necessary except the followings:

- * Noises observed on the screen
- * Tape damage
- * Parts, shown in the adjustment procedures for the tape transport system, item 1-3-3, were replaced.

<Adjustment reference>

Lower flange height of No. 8 guide is used as the basic reference for the transport adjustment, so do not move the No. 8 guide except replacing the No. 8 guide sleeve.

(1) Location of tape transport adjustment

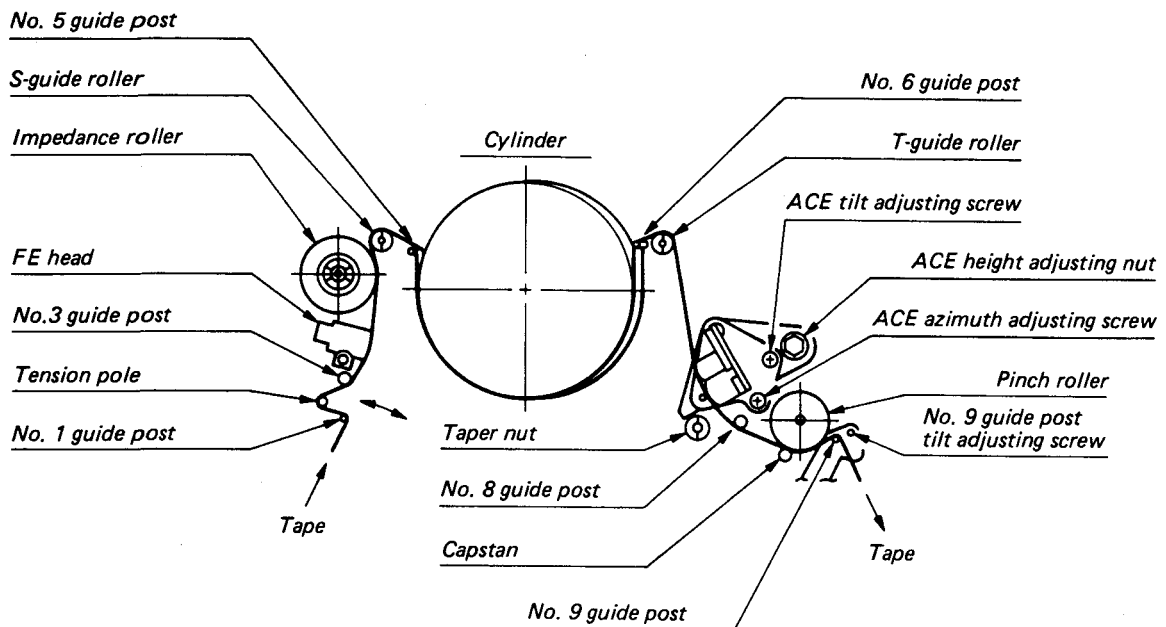


Fig. 1-4-4 Location of tape transport adjustment

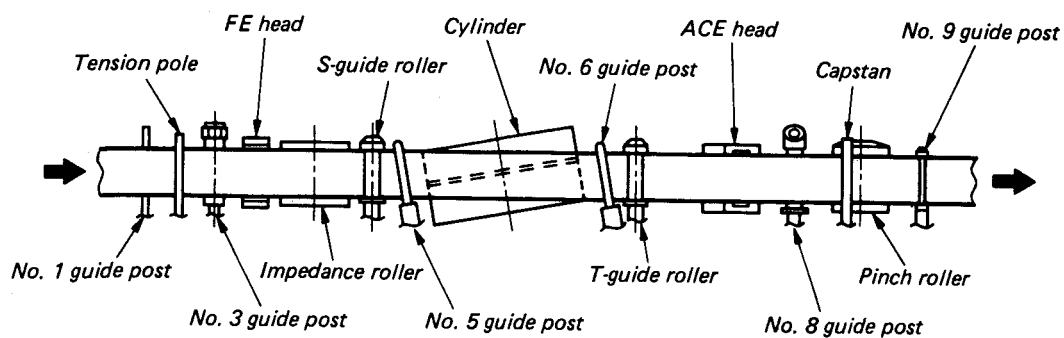
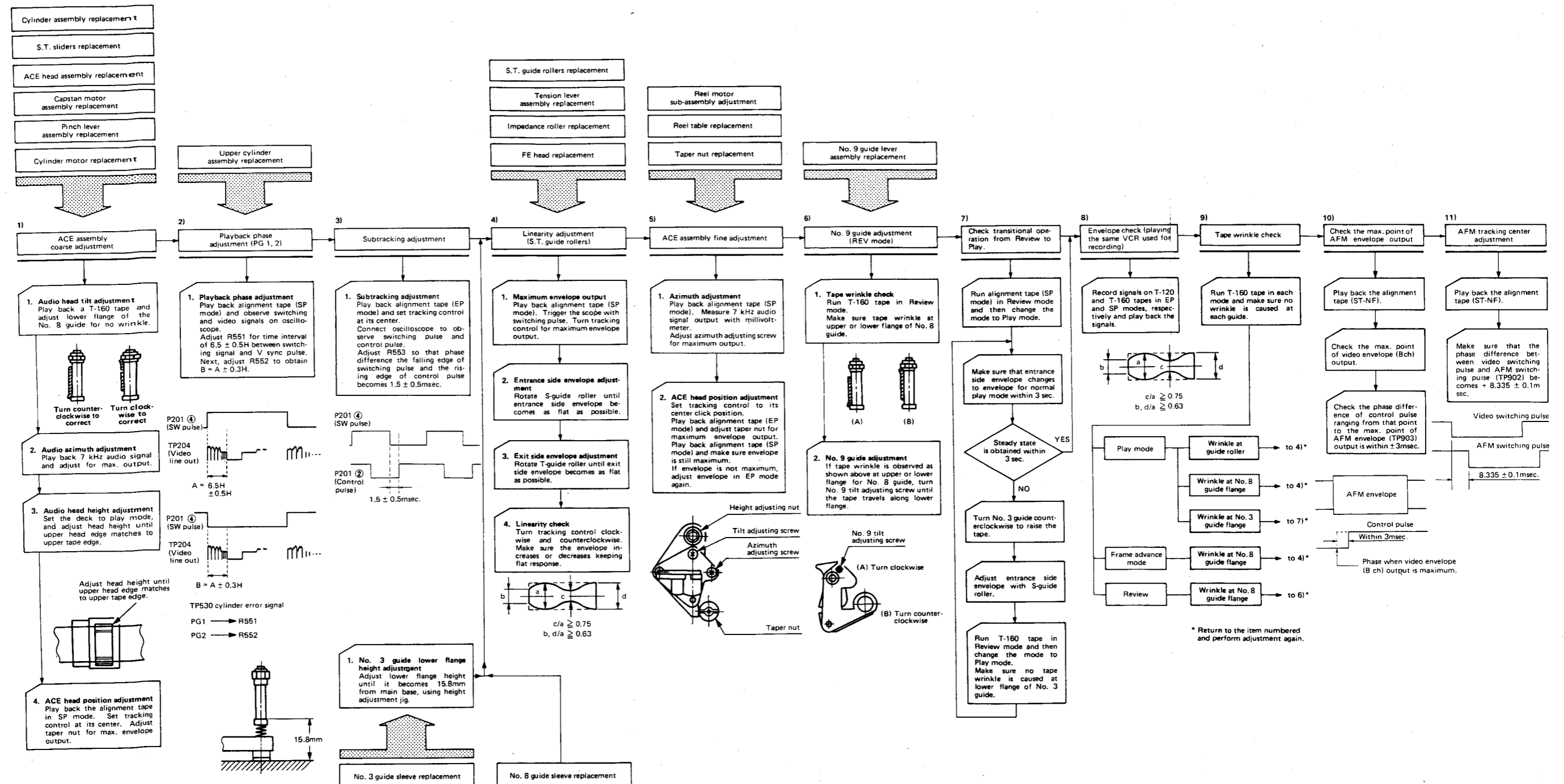


Fig. 1-4-5 Tape travel diagram

(2) Tape transport system adjustment flow chart.



(3) Tape transport system adjustment

* Pre-adjustment

When the part(s) listed in Table 1-4-1 was replaced, perform required adjustments by referring to procedures for the tape transport system.

When the part(s) listed in Table 1-4-1 was replaced, the tape path may be changed and may damage alignment tape. To prevent this, first run a T-160 tape and make sure excessive tape wrinkle does not occur at each tape guide.

1. If tape wrinkle is observed at the No. 3 guide, make sure of the preset height of the guide again.
2. If tape wrinkle is observed at the S, T-guide rollers, turn the S, T-guide rollers for no wrinkle.

Table 1-4-1

Part replacement	Adjustment procedure
<ul style="list-style-type: none"> * Cylinder complete assembly * S, T sliders * ACE head assembly * Capstan motor assembly * Pinch lever assembly * Cylinder motor 	From item 1)
* Upper cylinder	From item 2)
<ul style="list-style-type: none"> * S, T guide rollers * Tension lever assembly * Impedance roller * FE head * No. 3 guide sleeve 	From item 4)
<ul style="list-style-type: none"> * Reel motor sub-assembly * Reel table (S, T) * Taper nut 	From item 5)
* No. 9 guide lever	From item 6)

* Adjustment procedures

1) ACE head assembly adjustment

a. ACE tilt adjustment

1. Play back a T-160 tape and observe running condition of the tape at the lower flange of No. 8 guide.

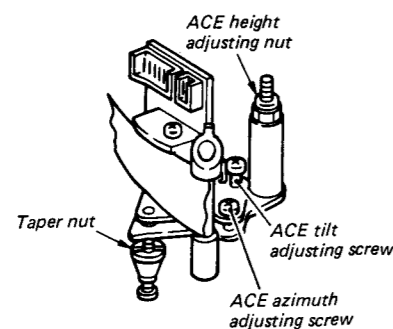


Fig. 1-4-6 ACE head assembly

2. Adjust the ACE tilt adjusting screw until tape wrinkle is caused at the lower flange of No. 8 guide as shown in Fig. 1-4-7(a).
3. Turn the ACE tilt adjusting screw counterclockwise until the tape travels along the lower flange as shown in Fig. 1-4-7(b).

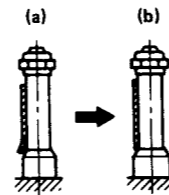


Fig. 1-4-7 No. 8 guide check

b. Audio azimuth adjustment

1. Play back the alignment tape (SP mode; ST-N1), 7 kHz portion of audio signals.
2. Connect a millivoltmeter to the audio line output terminal.
3. Turn the ACE azimuth adjusting screw to obtain maximum audio output.

c. Audio head height adjustment

1. Run the alignment tape (ST-N1) in the playback mode.
2. Observe surface of the audio head using a dental mirror.
3. White ceramic is provided on both sides of the audio and control heads of the ACE head assembly. Turn the ACE height adjusting nut so that lower tape edge matches to the upper edge of the ceramic on the lower head. If the previous method is deficient, play back the 1 kHz portion of the alignment tape (ST-N1) and adjust for maximum audio output.

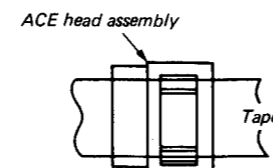


Fig. 1-4-8 Head height

d. ACE head position pre-adjustment

Note:

Before proceeding with this adjustment, remove adhesive cement applied on the taper nut.

1. Play back the alignment tape(ST-N1).
2. Adjust the taper nut for maximum video envelope output after the tracking control set at its center position.

2) Playback phase adjustment (PG1, PG2 adjustment)

1. Play back the alignment tape in the SP mode (ST-N1).
2. Observe a video signal on an oscilloscope display triggered with the switching pulse.
3. Adjust R551 for time interval of $6.5 \pm 0.5H$ (= A) between video switching signal and V sync pulse. (Fig. 1-4-9 (a))
4. Next, adjust R552 until time interval of $A \pm 0.3H$ is obtained between falling edge of SW pulse and V sync pulse. (Fig. 1-4-9 (b))

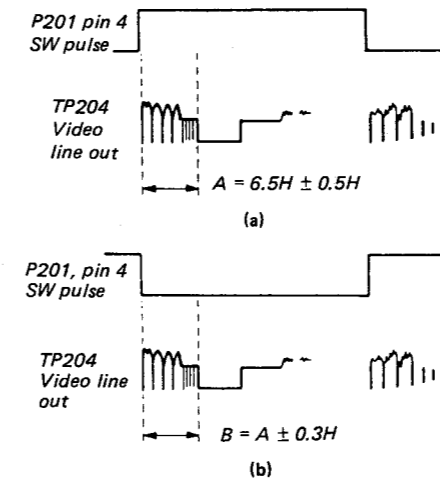


Fig. 1-4-9 Playback phase adjustment

3) Subtracking adjustment

1. Play back the alignment tape in SP mode (ST-N1).
2. Adjust R553 so that phase difference of $1.5 \pm 0.5\text{msec}$ is obtained between the rising edge of the video switching pulse and the rising edge of the control pulse. (Fig. 1-4-10)

Note:

In this case, adjust the tracking control at the click position.

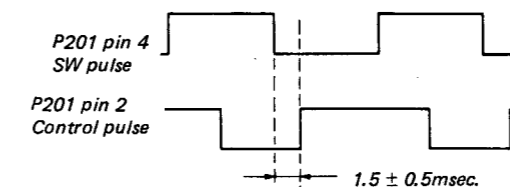


Fig. 1-4-10 Subtracking adjustment

4) Linearity adjustment (S, T-guide rollers adjustment)

1. Play back a 30% white (EP mode) signal on the alignment tape (ST-N1).
2. Observe the signal video envelope on an oscilloscope display triggered by the video switching pulse.
3. Make sure the video envelope waveform (in its maximum output) meets the specification shown in Fig. 1-4-11. If not, adjust as follows:

Note:

a = maximum output of the video envelope
b = minimum output of the video envelope at the entrance side
c = minimum output of the video envelope at the center point
d = minimum output of the video envelope at the exit side

4. In the same way check the envelope in the SP mode.

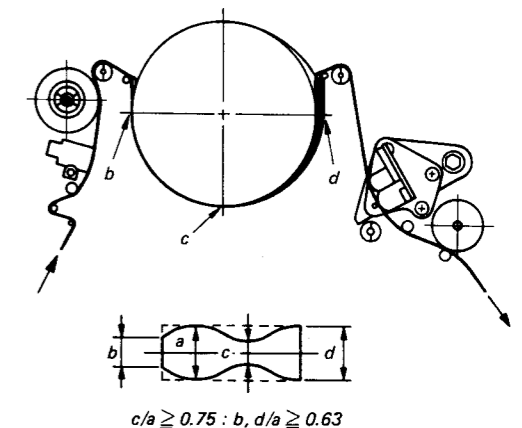


Fig. 1-4-11 Envelope waveform adjustment

5. If the A section in Fig. 1-4-12 does not meet the specification, adjust the S-guide roller in up or down direction.
6. If the B section in Fig. 1-4-12 does not meet the specification, adjust T-guide roller in up or down direction.

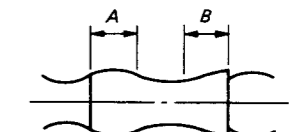


Fig. 1-4-12 Adjustment points

7. After completion of the adjustment(s), turn the tracking control and make sure video envelope variations are almost flat.
8. If the envelope varies as shown in Fig. 1-4-13, adjustment of the S, T-guide rollers may be upset, and perform the adjustment again.

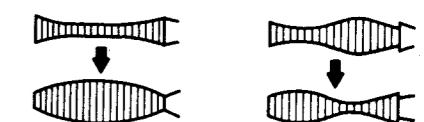


Fig. 1-4-13 Abnormal variation of the waveform

5) ACE head assembly fine adjustment

a. Tape wrinkle check at the lower flange of No. 8 guide

1. If tape wrinkle is observed at the lower flange of No. 8 guide, adjust the ACE tilt adjusting screw counterclockwise as shown in Fig. 1-4-6 until the wrinkle disappears.
2. If a gap is observed between the lower flange of No. 8 guide and the lower edge of tape, adjust the ACE tilt adjusting screw clockwise until the tape travels along the lower flange.

Note:

This adjustment should be made using a beginning part of T-160 tape.

b. Azimuth adjustment

1. Play back the 7 kHz audio signal on the alignment tape (ST-N1).
2. Adjust the ACE azimuth adjusting screw for maximum audio output as shown in Fig. 1-4-6.

c. ACE head position adjustment

1. Play back the 30% white signal on the alignment tape (ST-N1).
2. Place the tracking control at its center click position.
3. Trigger an oscilloscope with the video switching pulse and observe the video envelope waveform.
4. Turn the taper nut counterclockwise until the ACE base reaches the lower taper end of the taper nut as shown in Fig. 1-4-14.

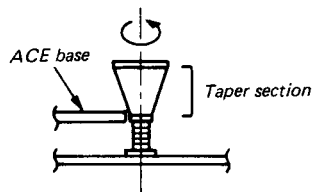


Fig. 1-4-14 Taper nut and ACE base

5. Turn the taper nut slowly counterclockwise and fix the taper nut at the position where the video envelope reaches a first peak level.
6. Play back the 2 MHz video signal on the alignment tape (ST-N1).
7. Make sure the video envelope is maximum with the tracking control set to the center click position.

Note:

- * If no video envelope is observed with the tracking control set to the center position, perform the video envelope adjustment to obtain maximum video envelope in both SP and EP modes, again.
- * If maximum video envelope deviates within $\pm 6\text{msec}$ from the tracking volume center, perform a fine adjustment with ST-N1 to output maximum video envelope. Play back ST-N1, and check the video envelope waveform is maximum with the tracking control set to the center position.

(Deviation of the maximum point should be within $\pm 2\text{msec.}$)

8. Play back the 2 MHz video signal on the alignment tape (ST-N1) and make sure the audio output is maximum.

Note:

- * After completion of the ACE head position adjustment, the ACE base must be positioned at approximately the center of the taper nut as shown in Fig. 1-4-15.

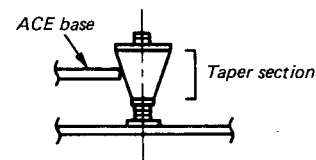


Fig. 1-4-15 Position of taper nut after adjustment

6) No. 9 guide lever adjustment

1. Set T-160 to the Cue mode. Switch the Cue mode to the Review mode when the tape has been rewound into the T-reel table to some extent.
2. Check tape wrinkle at the upper and lower flange of No. 8 guide. If no tape wrinkle is observed along the lower flange, no adjustment is required.
3. If the tape runs along the upper flange or tape wrinkle occurs, turn the No. 9 tilting screw in Fig. 1-4-16 counterclockwise and adjust the screw until the tape runs along the lower flange.
4. If tape wrinkle occurs at the lower flange, turn the No. 9 tilting screw in Fig. 1-4-16 clockwise for no tape wrinkle.

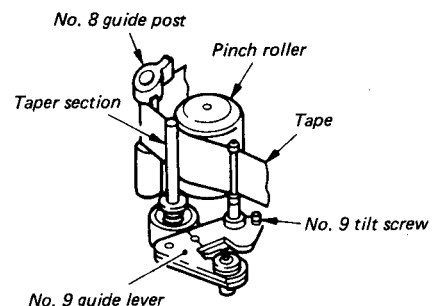


Fig. 1-4-16 No. 9 guide lever adjustment

7) Check for transitional operation from Review to Play

1. Play back the alignment tape (ST-N1) in Review mode and observe the video envelope with an oscilloscope.
2. Switch the Review mode to the Play mode. When switched to the Play mode, make sure the entrance side envelope comes to an approximate steady state within 3 seconds as shown in Fig. 1-4-17.

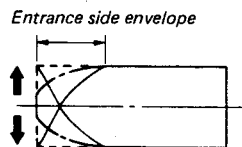


Fig. 1-4-17 Video envelope rising when operation mode is switch from review to play mode

If it does not rise within 3 seconds, adjust as follows:

3. Turn the No. 3 guide nut counterclockwise to adjust the lower flange height as shown in Fig. 1-3-21. Make sure the tape travels along the lower flange.
4. Play back an alignment tape (2 MHz video signal). Since entrance side linearity varies as the height of No. 3 guide varies, adjust the S-guide roller to correct the linearity.
5. Change operation mode from the Review to the Play mode again and make sure the entrance side envelope rises within 3 seconds. If not, perform the adjustment again from item 3.
6. Play back the T-160 tape in the Play mode and make sure no tape wrinkle occurs at the lower flange of the No. 3 guide. If the tape is raised too high at the No. 3 guide, the tape will be damaged. So if tape wrinkle occurs, turn the No. 3 guide nut clockwise until the wrinkle disappears and then perform adjustment from item 4.

Note:

If the rising characteristic is poor in Review mode, screen noises may occur in synchronous editing recording. Perform the adjustment carefully.

8) Envelope check

1. Make recordings on T-120 and T-160 tapes in both SP and EP modes, and make sure the playback output envelope meets the specification shown in Fig. 1-4-11.
2. In playback using the same video deck as used for the recording, (with a T-120) the video envelope should meet the specification shown in Fig. 1-4-18.
3. If the performance does not meet both specifications 1 and 2 above, replace the upper cylinder assembly.

4. Set the deck to EP mode with a T-120 tape wound at its beginning position and confirm operation of the synchronous editing.
5. If picture noises are observed at the starting position of the editing, adjust the preset height of the No. 3 guide again.

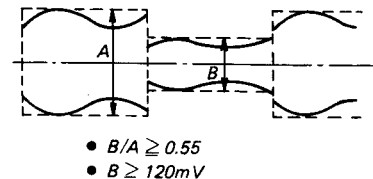


Fig. 1-4-18 Envelope output and output level difference

9) Tape wrinkle check

1. Play back the T-160 tape in the playback, Cue, Review and the frame feeding mode, and observe tape wrinkle at each guide.
2. If excessive tape wrinkle is observed at the mode shown below, perform the associated adjustments also shown below.
 - a. Playback mode
 - Tape wrinkle at the S, T-guide roller section
 - Item 4: Linearity adjustment
 - Tape wrinkle at No. 8 guide flange
 - Item 4: Linearity adjustment
 - Tape wrinkle at No. 3 guide flange
 - Item 7: Rising characteristic check in mode change from Review to Play mode.
 - b. Cue/Review mode
 - Tape wrinkle at No. 8 guide
 - Item 6: No. 9 guide lever adjustment
 - c. Frame feeding mode
 - Tape wrinkle at No. 8 guide
 - Item 4: Linearity adjustment

10) Maximum AFM envelope check (Fig. 1-4-19)

1. Play back ST-NF (3 MHz, AFM standard signal) tape.
2. Trigger with switching pulse. Adjust the tracking volume control, and check the phase of control pulse at the maximum video envelope output (Bch).
3. Check phase between the maximum point and the maximum AFM envelope is within $\pm 3\text{msec}$. At that time, also check each channel A and B of AFM envelope is within $\pm 3\text{msec}$.

Note:

When the phase difference exceeds 3 msec, replace the upper cylinder.

- * AFM envelope terminal
- TP903 on Hi-Fi audio P.C. board

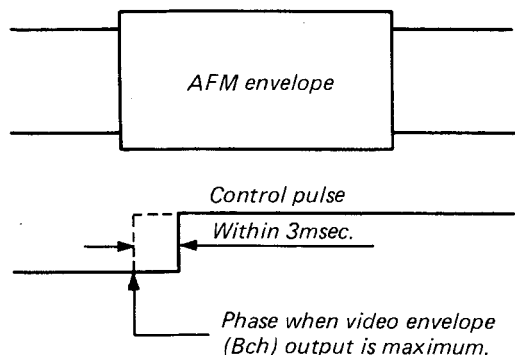


Fig. 1-4-19 Control pulse phase at the maximum AFM envelope output

11) AFM tracking center adjustment (Fig. 1-4-20)

1. Play back ST-NF (color bar, AFM 400 Hz standard signal) tape.
2. Make sure that the phase difference between the video switching pulse and AFM switching pulse is $8.335 \pm 0.1\text{msec}$.

- * AFM switching pulse terminal
- TP902

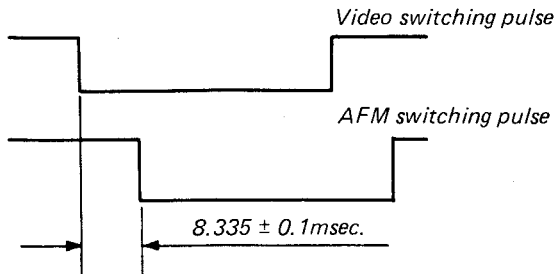


Fig. 1-4-20 Phases of video and AFM switching pulse

2. ELECTRICAL ADJUSTMENT

<Test equipments required>

Adjustment will be performed with the following test equipments.

1. Color TV (Monitor)
2. Oscilloscope, 2 CHs, 15 MHz or higher with delay system
3. Frequency counter (7 digits or higher)
4. Millivoltmeter
5. Digital voltmeter
6. Tester (20K ohm/V)
7. Audio generator
8. Audio attenuator
9. Alignment tapes
Part code: ST-N1: 70909202
ST-NF: 70909203
10. Alignment screw driver (jig)
11. Color pattern generator
12. Video sweep generator

<Color bar signal>

Color bar signals of 75% recorded on the alignment tapes are shown in Fig. 2-1-1.

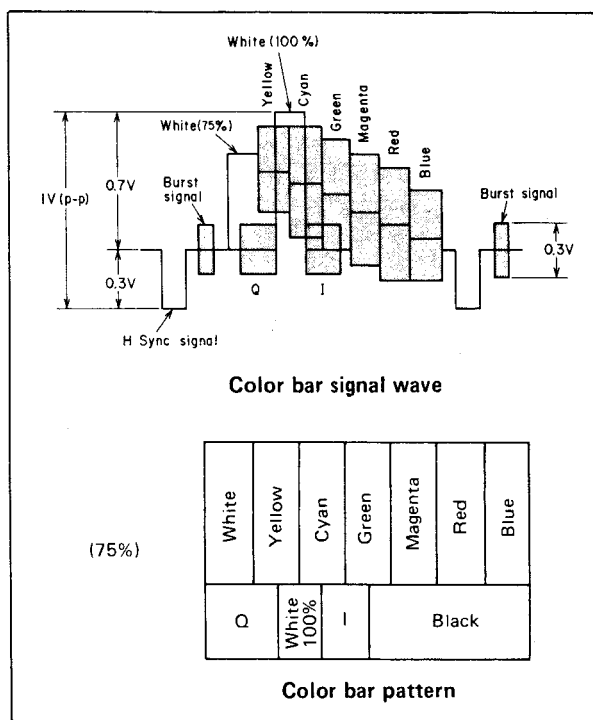


Fig. 2-1-1

<Specified input and output levels, and impedance>

Video input: Negative sync, standard composite video signal 1Vp-p, 75 ohm

Video output: Same as the video input. 1Vp-p, 75 ohm

Audio input: -8 dBs, 47k ohm

Audio output: -6 dBs, 10k ohm

<Alignment sequence>

Proceed the alignments in the sequence as shown in Fig. 2-1-2.

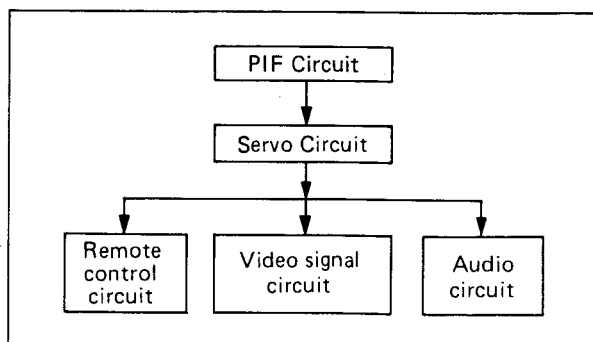
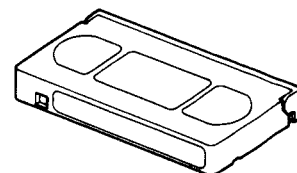


Fig. 2-1-2

Alignment tape specifications



[1] ST-N1

Item No.	Video signal	Audio signal	Contents	Record	
				Mode	Time
1-1	Color bar	1 kHz	<ul style="list-style-type: none"> ● Check and adjustment of Servo circuit. ● Check and adjustment of Video circuit. ● Check and adjustment of Audio circuit. 	SP	10 min.
1-2	Retma Pattern	3 kHz	<ul style="list-style-type: none"> ● Check and adjustment of Servo circuit. 	SP	10 min.
1-3	2 MHz (recorded on CH-A only)	Record each 400 Hz & 7 kHz for 1 min. 30 sec. in 3 cycles.	Notes: 1. This signal is used for tape running adjustment. 2. Set tracking volume (VR) to center click position except linearity adjustment. 3. When making linearity adjustment (S, T guide roller), set tracking VR to the position where envelope obtains max.	SP	9 min.
1-4	Color bar	3 kHz	<ul style="list-style-type: none"> ● Check and adjustment of Servo circuit. ● Check and adjustment of Video circuit. 	EP	5 min.
1-5	30% White	No signal	<ul style="list-style-type: none"> ● Check and adjustment of Servo circuit. Notes: 1. This signal is used for tape running adjustment also. 2. Set tracking VR to center. When making linearity adjustment, set tracking VR to the position where envelope obtains max.	EP	5 min.

[2] ST-NF (Hi-Fi Audio (AFM) adjustment)

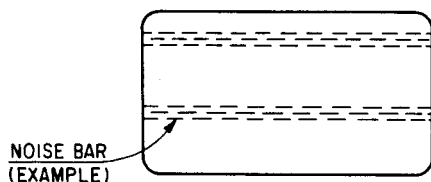
Item No.	Video signal	Hi-Fi audio signal (re-recorded on video track)	Contents	Record	
				Mode	Time
2-1	3 MHz (recorded on CH-A only)	AFM 400 Hz	Notes: This signal is used for tape running adjustment. Set tracking VR to center click position.	SP	5 min.
2-2	Color bar	AFM 400 Hz	<ul style="list-style-type: none"> ● Check and adjustment of Hi-Fi audio circuit (Set tracking VR to the position when audio FM output level obtains max.) Note: This signal is used for tape running adjustment also. Set tracking VR to center click position.	SP	5 min.
2-3	Color bar	Carrier 1.3 MHz(Lch) 1.7 MHz(Rch)		SP	5 min.

2-2-4. Double speed playback (EP mode)

1. Play back a tape (recorded in the EP mode) at double speed mode.
2. Adjust R558 until noise bars disappear on the monitor screen.

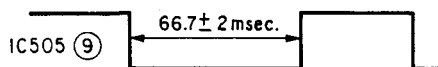
Note:

This adjustment should be made after completion of the subtracking adjustment.



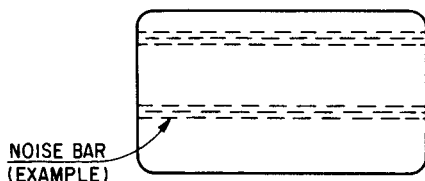
2-2-5. 1/4 slow APC

1. Connect the oscilloscope to pin 9 of IC505.
2. Play back a tape (recorded in the SP mode) in the slow mode.
3. Adjust R555 until the low level period of the waveform shows 66.7 ± 2 msec, triggering the scope at falling edge of the output at pin 9 of IC505.
4. Make sure no noise appears on the monitor screen.



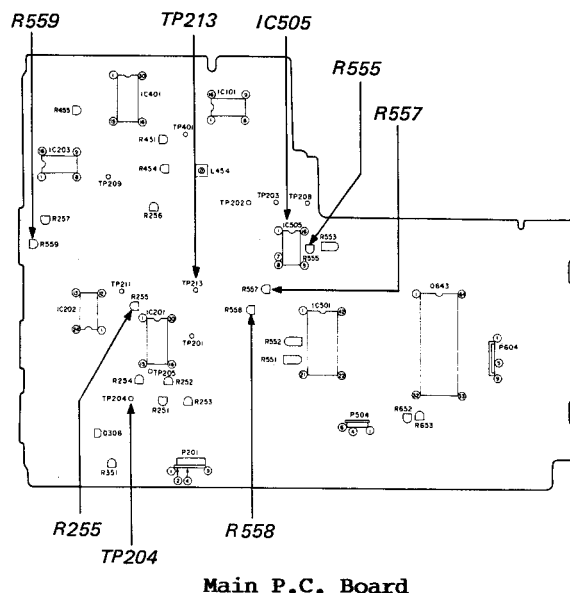
2-2-6. Reverse slow playback (EP mode)

1. Play back a tape (recorded in the EP mode by the VCR under test) in the reverse slow mode.
2. Adjust R557 so that noises disappear on the screen.
3. Make sure noises do not appear on the screen in the forward slow mode.
4. Observe waveform at pin 7 of IC505 and make sure the low level period does not exceed 120msec.



2-2-7. Pseudo V sync

1. Play back a tape (recorded in the SP mode by the VCR under test) in the still mode.
2. Adjust R559 for minimum jitter on the monitor screen.



2-3. Video Circuit

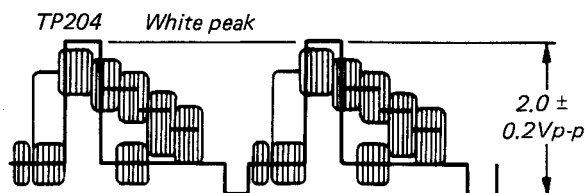
Note:

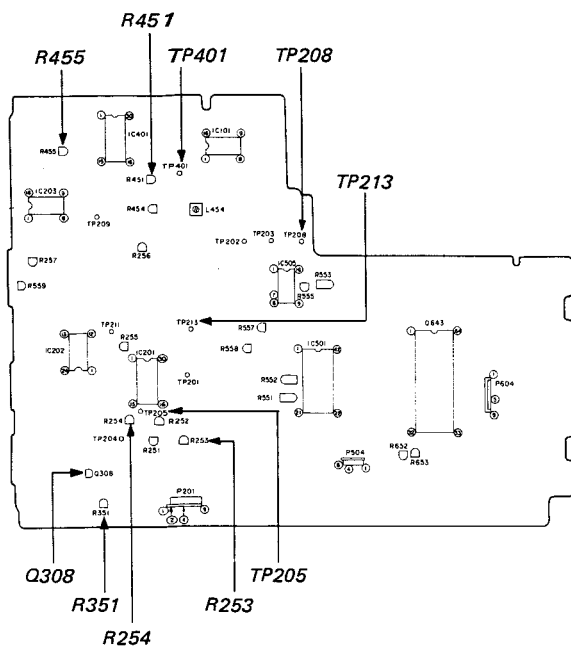
Unless otherwise specified, following setting conditions will be used in the adjustments which follows:

- * External input Color bar signal
- * Tape speed selector. . . SP mode
- * Input select switch. . . LINE
- * Picture select switch. HP
- * TV still button. OFF
- * OSP button OFF
- * Picture control. Center click position
- * Tracking control Center click position
- * TV/VCR switch. VCR position
- * PCM switch OFF

2-3-1. EE level

1. Connect the oscilloscope to TP204 and trigger the scope with the composite sync signal at TP213. Adjust the scope so that it can display a waveform of approx. 2H. Set the VCR to the EE mode.
2. Adjust R255 to obtain $2.0 \pm 0.2V_{p-p}$ between the sync tip and 100% white level.

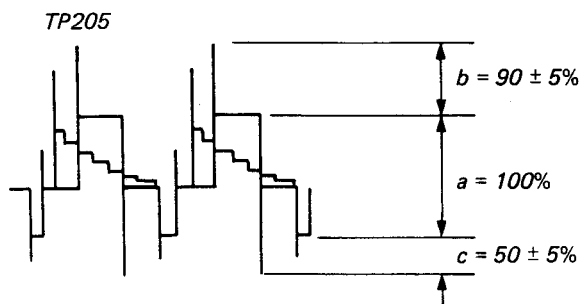




Main P.C. Board

2-3-7. White clip, dark clip

1. Feed the color bar signal to the line input terminal.
2. Set the VCR to the EE mode. (EP Mode)
3. Connect the oscilloscope to TP205 and trigger the scope with a composite sync signal at TP213. Adjust the scope so that it can display a waveform of approx. 2H.
4. Adjust R254 so that amplitude of overshoot appearing on the white peak side shows $90 \pm 5\%$ of a 100% Y signal amplitude.
5. Adjust R253 so that undershoot appearing on the sync tip side shows $50\% \pm 5\%$ of a 100% Y signal amplitude.

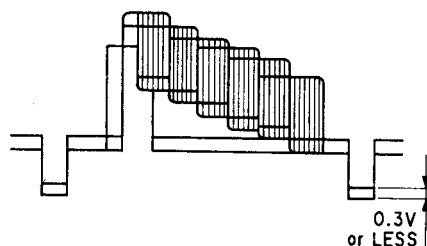


2-3-8. Digital DC level

1. Feed the color bar signal to the line input terminal.
2. Connect the oscilloscope to Q308 emitter and trigger the scope with a composite sync signal at TP213. Adjust the scope so that it can display a waveform of approx. 2H.
3. Adjust R351 so that a minimum variation of sync tip voltage is obtained when EE mode is changed to TV still mode by pushing the TV Still button.

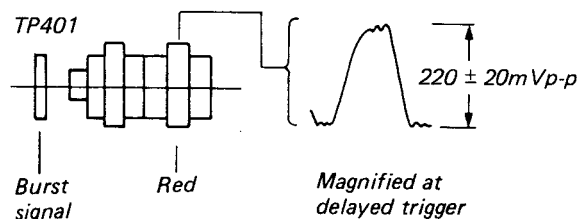
Note:

The DC voltage difference should be less than 0.3V DC.



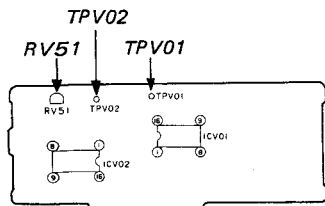
2-3-9. Color record current

1. Feed the color bar signal to the line input terminal, and set the VCR to the record mode (SP mode)
2. Connect the oscilloscope to TP401 and trigger the scope with a composite sync signal (TP213). Adjust the scope so that it can display a waveform of approx. 2H.
3. Adjust R451 to obtain a red signal amplitude of $220 \pm 20\text{mVp-p}$.



2-3-10. 3.58 MHz alignment

1. Play back the alignment tape ST-N1 (color bar signal, SP mode)
2. Connect the frequency counter to TP208 and set the measurement range to a position which allows reading accuracy of 1Hz.
3. Adjust R455 until the frequency reading of $3579545 \pm 20\text{Hz}$ is obtained.



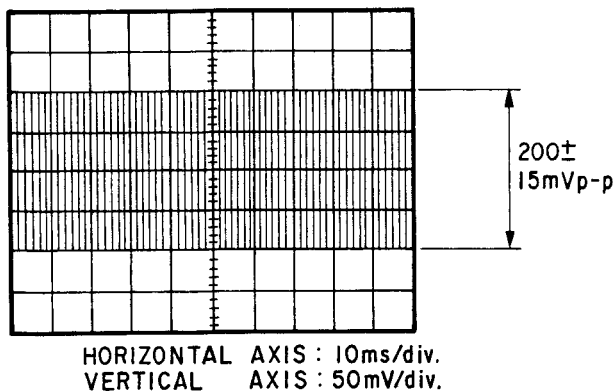
Pre Amp P.C. Board

2-3-11. Recording FM voltage

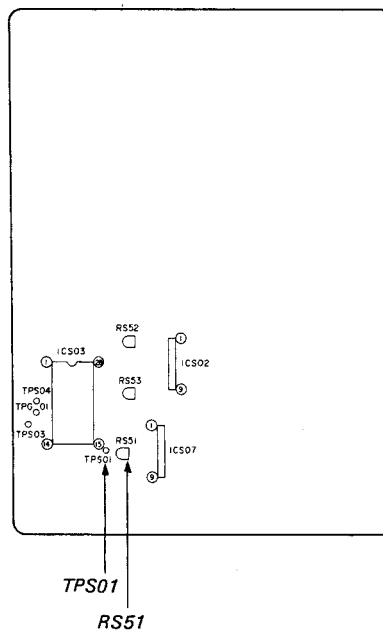
1. Short-circuit the line input terminal. Do not apply any signal to the terminal.
2. Set the VCR to the record mode (EP).
3. Connect the oscilloscope's ground terminal to TPV02 and the scope probe to TPV01.
4. Adjust RV51 until amplitude of 50% white signal shows $200 \pm 15\text{mVp-p}$.

Note:

When connecting oscilloscope's ground terminal, connect it to TPV02. Do not use any other ground terminal.



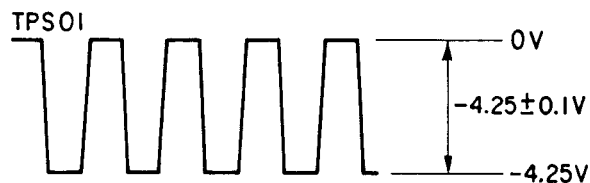
2-4. PCM Circuit

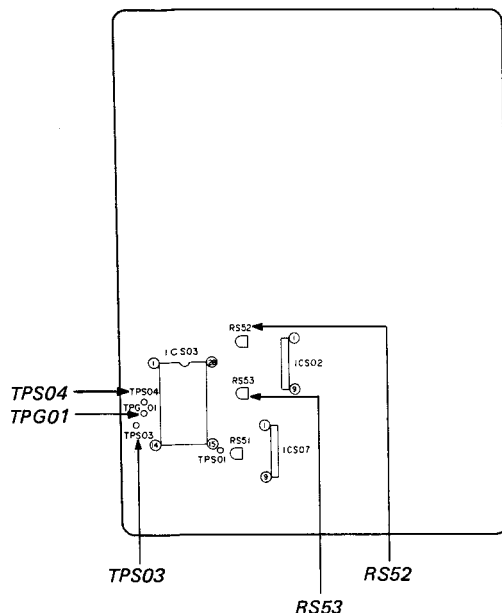


PCM P.C. Board

2-4-1. L-channel non-input integration voltage

1. Set the VCR to EE or REC mode.
2. Connect the oscilloscope to TPS01.
3. Short-circuit the line input terminal to feed no signal.
4. Place the VCR/PCM switch in the PCM position.
5. Adjust RS51 until the voltage E shows $-4.25\text{V} \pm 0.1\text{V}$.

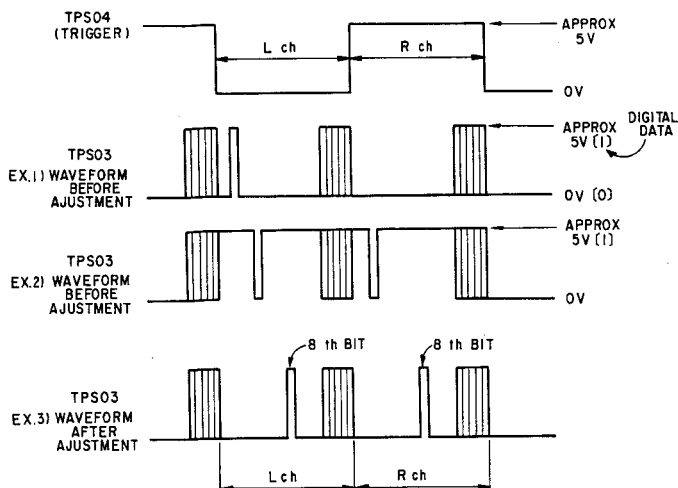




PCM P.C. Board

2-4-2. Digital data code offset

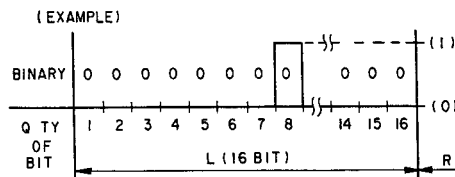
1. Set the VCR to EE or REC mode.
2. Connect the oscilloscope to TPS03, and trigger the scope with the signal at TPS04.
3. Adjust RS53 so that 8th bit shows "1" ("H" level).



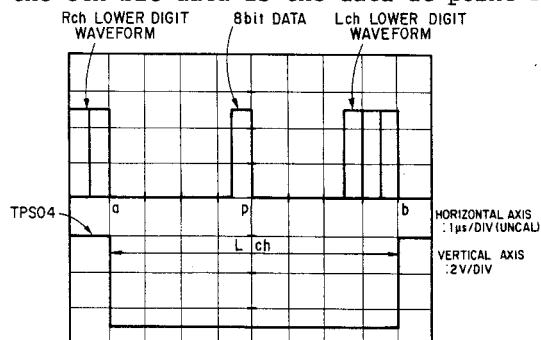
4. If the adjustment is impossible, readjust the item 2-4-1.

Note:

[How to identify the 8th bit data]
Each left and right channel digital data consists of 16 bits.

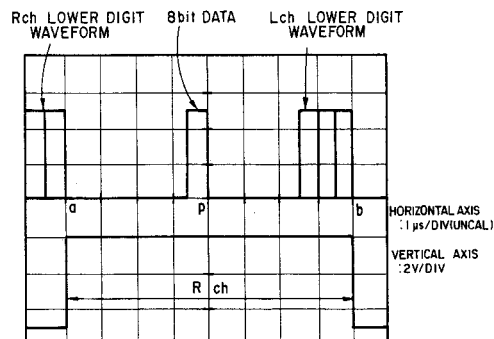


1. Observe waveform of L-channel data with an oscilloscope.
2. Adjust the scope so that the L-channel waveform is just positioned between 1st horizontal scale (point a) and 9th scale (point b). [Channel changing point can be identified by observing that the lowest digit waveform is blurred (vertical stripes).]
3. Since the L-ch data (16 bits) are positioned between the points a and b, the 8th bit data is the data at point P.

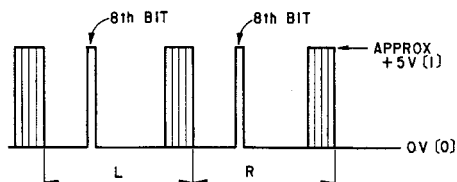


2-4-3. R-channel non-input integration voltage

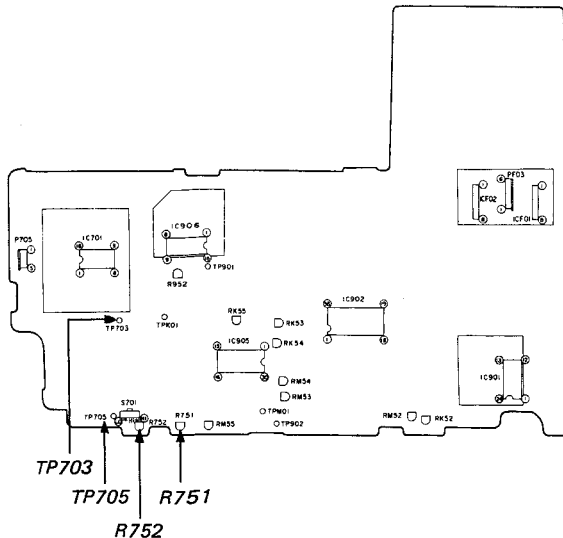
1. Display the R-ch waveform in the same way as shown previously. (Change over the oscilloscope's SLOPE SW.)
2. Adjust RS52 so that the R-ch waveform shows the same waveform as that of the L-ch.



L & R channel waveforms after adjustment



2-5. Conventional audio circuit



Audio P.C. Board

Note:

Set front panel control switches as shown below:

Audio output select switch Conventional audio mode
Input select switch . . . LINE
TV/VCR switch VCR
PCM switch. off

- * Use AUDIO (Hi-Fi/Normal) IN JACK L-ch as the external signal input terminal.
- * Connect 47K ohm loads to both L and R channel audio output terminals.
- * Perform the head azimuth adjustment and head height adjustment perfectly, and then proceed to the adjustments 2-5-1, 2-5-5.

2-5-1. Playback output level (Audio line output terminal, R751)

1. Connect a millivoltmeter to the audio line output terminal and play back the alignment tape (ST-N1).
2. Adjust R751 until the output level shows $-6\text{dBs} \pm 0.5\text{dBs}$.

2-5-2. Record/Erase oscillator frequency (TP703)

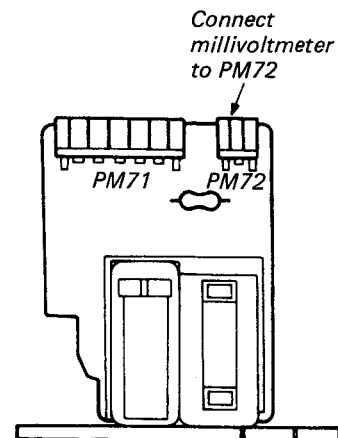
1. Connect a frequency counter to TP703.
2. Set the VCR to the After Recording mode and check the frequency counter shows $65\text{ kHz} \pm 6.5\text{ kHz}$, (f1).
3. Set the VCR to the REC mode, and check the reading of frequency counter. If the frequency is higher by more than 1.8 kHz from the frequency of After Recording mode (f1), set S701 to the "Lo" position, and if lower by more than 1.8 kHz, set the switch to the "Hi" position.
4. Make sure the reading of the frequency counter is $f1 \pm 1.8\text{ kHz}$.

2-5-3. Bias current (PM72, R752)

1. Short-circuit the audio line input terminals. Disconnect any signal lines from the input terminals.
2. Connect a millivoltmeter to PM72, pins 1 - 2 (GND).
3. Set the VCR to the REC mode and adjust R752 to obtain $3.2 \pm 0.05\text{mVrms}$.

Note:

Value adjusted too high lowers high frequency response and too low increases distortion.



2-5-4. Record/Playback output level (Audio line output terminal)

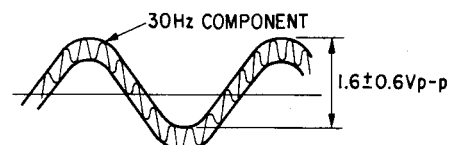
1. Feed 400 Hz, -8 dBs signal to the AUDIO Line input terminal.
2. Connect a millivoltmeter to the AUDIO Line out terminal. Terminate the video Line input terminal with a 75 ohm resistor.
3. Record the signal in SP mode and play back the signal just recorded.
4. Make sure reading of the millivoltmeter shows $-6\text{ dBs} \pm 3\text{ dB}$.

2-5-5. Auto-find signal recording (TP705)

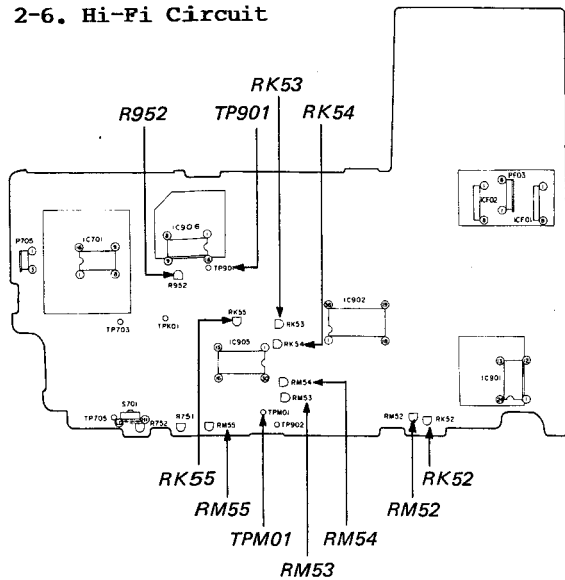
1. Connect the oscilloscope to TP705.
2. Connect pin 5 of P705 to GND.
3. Set the VCR to REC mode. Make sure the auto find signal (30 Hz sinewave) is $1.6 \pm 0.6\text{Vp-p}$.
4. Set the VCR to STOP mode and disconnect pin 5 of P705 from GND.
5. Set the VCR to REC mode, and make sure the auto find signal is observed for the first 1 sec. Also make sure the auto find signal appears when AVI key is pushed during recording.

Notes:

- * The auto-find signal is not generated during synchronous editing operation. Check the signal by changing operation mode from STOP to REC.
- * When pin 5 (Cue I/O) of P705 is grounded, the auto-find signal is always generated during recording.



2-6. Hi-Fi Circuit



Audio P.C. Board

Notes:

- * Unless otherwise specified, set the switches on the front panel as follows:
Output select switch.STEREO mode
Meter select switch.LEVEL
Input select switch.LINE
AUDIO REC select switch.AUTO
Tape speed select switch.SP
PCM switch.OFF
- * Connect 47k ohm resistors to the left and right channel audio line output terminals.
- * Use AUDIO (Hi-Fi/Normal) IN JACK as the external signal input terminals.

2-6-1. Level meter adjustment (Audio line output terminal, level meter, RM52, RK52)

1. Connect a millivoltmeter to the audio line output terminal (L-ch).
2. Manually select the left channel output to turn on "L" indicator inside the level meter.
3. Set the AUDIO REC Select SW to MANUAL and adjust input level so that audio line output level shows -6dBs (400 Hz).
4. Adjust RM52 until 0dB indicator on the L channel side just lights up.
5. Adjust RK52 until 0dB indicator on the R channel side just lights up.
6. Next, check following items.
7. When the input level is changed to -7dBs audio line output level, check the 0dB indicator turns off.
8. When the input level is changed to -5dBs, check the 0dB indicator lights up.

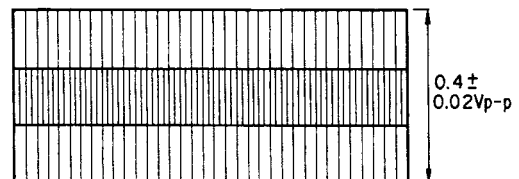
2-6-2. Carrier frequency adjustment (TPM01, TPK01, RM54, RK54)

1. Short-circuit the audio line input terminals. Do not feed any signal to the terminals.
2. Connect the frequency counter to TPM01.
3. Set the VCR to the record mode.
4. Adjust RM54 until the frequency counter shows $1.3 \text{ MHz} \pm 10 \text{ kHz}$.

5. Connect the frequency counter to TPK01 and adjust RK54 until the frequency counter shows $1.7 \text{ MHz} \pm 10 \text{ kHz}$.

2-6-3. Record level (TP901, R952)

1. Short-circuit the audio line input terminals. Do not feed any signal to the terminals.
2. Connect the oscilloscope to TP901.
3. Set the VCR to the record mode.
4. Adjust R952 to obtain $0.40 \pm 0.02 \text{ Vp-p}$, more than 15 sec after the recording start.



2-6-4. Playback output level (Audio line output terminal, RM55, RK55)

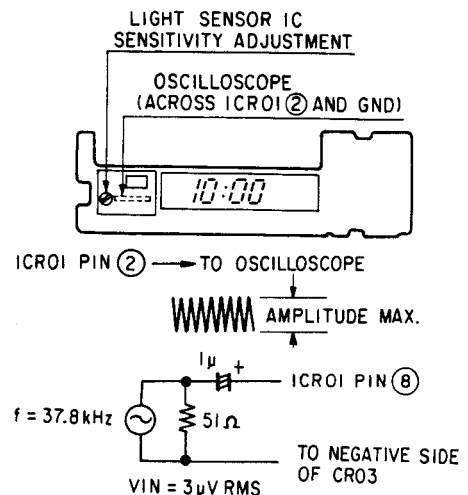
1. Connect the millivoltmeter to the audio line output terminal.
2. Play back the alignment tape (ST-NF).
3. Adjust RM55 until the line output level of L channel shows -6dBs (388mVrms) $\pm 0.5 \text{ dB}$.
4. Adjust RK55 until the line output level of R channel shows -6dBs (388mVrms) $\pm 0.5 \text{ dB}$.

2-6-5. FM deviation (Audio line output terminal RM53, RK53)

1. Apply -8dBs (309mVrms), 400 Hz to the audio line input terminals.
2. Record the signal, and play back the tape just recorded and adjust RM53 until the left channel audio line output shows -6dBs (388mVrms) $\pm 0.5 \text{ dBs}$.
3. Record the signal, and play back the tape just recorded and adjust RK53 until the right channel audio line output shows -6dBs (388mVrms) $\pm 0.5 \text{ dBs}$.

2-7. Wireless Remote Control Circuit

1. Connect the oscilloscope across pin 2 of ICRO1 and the ground.
2. Feed a signal of 37.8 kHz, 3μVrms across pin 8 of ICRO1 and (-) side of CRO3 through the network as shown.
3. Adjust LR51 for maximum amplitude on the scope display.



SECTION 3

SERVICING DIAGRAMS

1. Inspection Procedure

Operation steps		Items to be confirmed	Inspection block	Page	
				Block Diagram	Circuit Diagram
1. AC Plug-in	Clock setting Program & timer setting	Clock display Clock setting operation	Power (AC system) Timer counter	3-13 3-17	3-59 3-69
2. Power SW ON	Timer/counter, memory, SP/EP, TV/VCR SW (in VCR), Channel selection, EE picture sharpness & tone quality, TV/VCR SW (in TV)	Mode display lamp TV receive condition Channel select operation, EE picture sharpness & tone quality, Signal level, Stereo	Power Logic RF, Reception Video (EE, Rec mode) Audio (EE, Rec mode) Conventional Audio Hi-Fi Audio	3-13 3-21 3-15 3-36 3-43 3-43	3-59 3-75 3-63 3-94 3-120 3-115
3. Cassette-in and Cassette-out	Cassette-in Cassette loading Eject Cassette out	F/L mecha. operation Cassette loading operation Eject operation Indicator lamp Abnormal sound	Logic	3-21	3-75
4. Key entry Operation Remote-control	REC, PLAY Cue/Review Still, Double speed/slow Reverse slow/FF/REW Memory (Rewind ON → Play ON)	Indicator lamp Each mode operation (Tape drive operation) Abnormal sound Memory	Logic Remote control block	3-21 3-137	3-75 3-138
5. Special Functions Audio Power ON Auto Play Auto Rewind	Cassette-in at Power OFF Tape whose tabs are folded is inserted. REC/PLAY/CUE	Power ON, Cassette down Power OFF after tape wound Rewind automatically after tape wound	Power Logic	3-13 3-21	3-59 3-75
6. Playback Functions Picture sharpness Tone Quality Others	PLAY (Test tape: ST-NI/ST-NF) Cue/Review Still/Slow	Resolution, S/N Hue, Saturation, Color unevenness, Color dropout, Sound distortion, Level variation, Picture noise, Jitter, Picture swing, Skew distortion, Flicker, Beat	Video PLAY system Conventional Audio PLAY system Hi-Fi Audio PLAY system Servo system	3-36 3-43 3-43 3-32	3-94 3-120 3-115 3-87
7. REC/PLAY Functions Picture sharpness Tone Quality Others	REC/PLAY	Resolution, S/N Hue, Saturation, Color unevenness, Color dropout, Sound distortion, Level variation, Picture noise, Jitter, Picture swing, Skew distortion, Flicker, Beat	Video PLAY system Conventional Audio PLAY system Hi-Fi Audio PLAY system Servo system	3-36 3-43 3-43 3-32	3-94 3-120 3-115 3-87

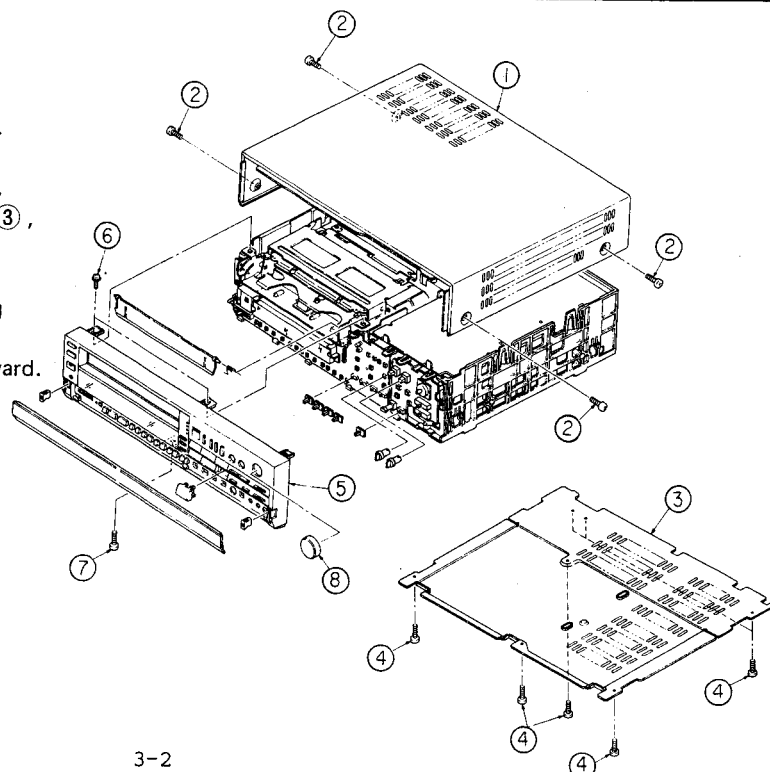
Operation steps		Items to be confirmed	Inspection block	Page	
				Block Diagram	Circuit Diagram
8. PCM Play PCM Rec	PCM SW ON Play PCM recorded tape	PCM display lamp ON PCM tracking display LED ON Abnormal sound Play picture noise Monitor picture bit pattern	Timer block PCM PLAY system Servo PLAY system Video PLAY system PCM Rec system Video Rec system	3-17	3-69
				3-48	3-133
				3-32	3-87
				3-36	3-94
9. Timer Screen	Timer screen ON	Display tube Clock screen, Program screen Light pen tone Light pen operation	Timer block Timer screen Video signal selection Timer screen Hi-Fi Audio selection Light pen input Timer screen	3-17	3-69
				3-29	3-81
10. Multi Picture	EE Multi series Multi memo Multi still PLAY Multi series Multi memo Multi still Forward/Reverse Slow Multi series	Skew Picture swing	Logic, Memory control, Servo, Video Logic, Memory control, Servo, Video Memory control, Video	3-21	3-75
				3-36	3-94
		Color fada away/ Hue shear Distortion Picture malfunction	Memory control, Video Logic, Servo, Memory control Memory control, Video	3-40	3-106
				3-32	3-87

How to use the table

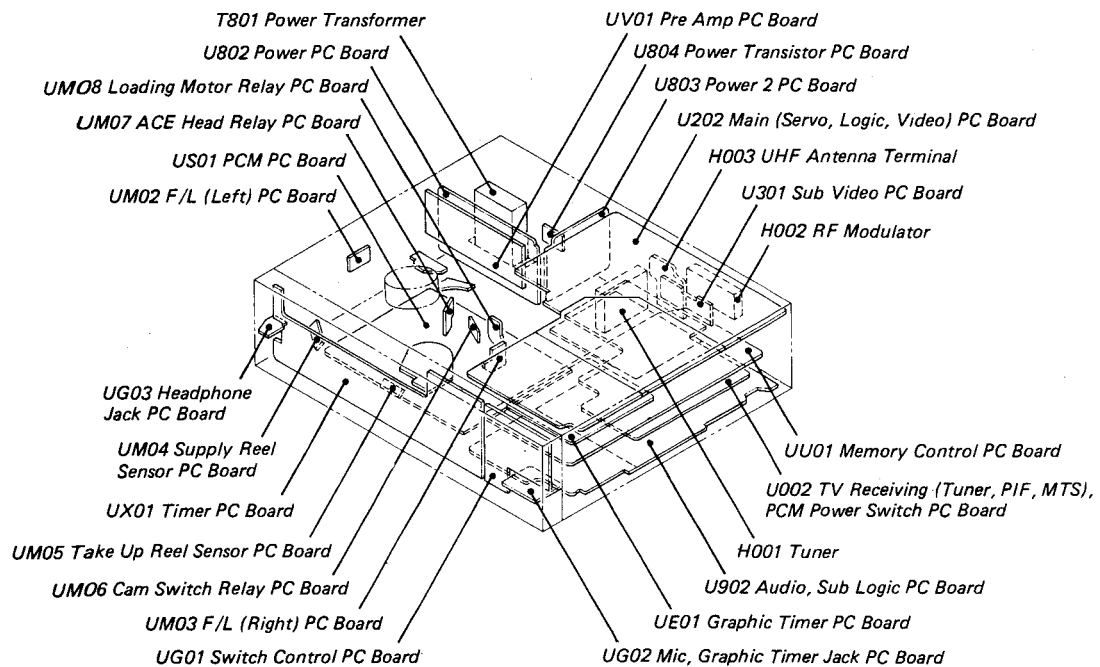
1. When inspecting a defective VCR, proceed according to the steps shown in the table.
2. Check the items to be confirmed for each operation step.
3. If a problem is found on the item, check waveforms (level) referring to the block diagram relating to the items.
4. Use PC board pattern diagram and schematic diagram to examine the circuit precisely.
5. After completion of the repair work, check steps 1 ~ 10 again.

2. Removal of Cabinet

1. Disconnect power cord plug from AC outlet.
2. Remove 4 screws ② securing top cover ①.
3. Remove top cover ① by sliding it backward.
4. Remove 7 screws ④ securing bottom cover ③, and remove the bottom cover.
5. Remove 1 knob ⑧.
6. Remove 2 screws ⑥ and 1 screw ⑦ securing front panel ⑤.
7. Remove the front panel ⑤ by sliding it forward.



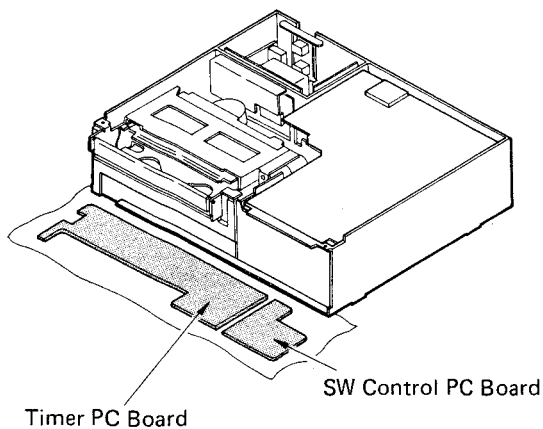
3. Electrical Units Location Diagram



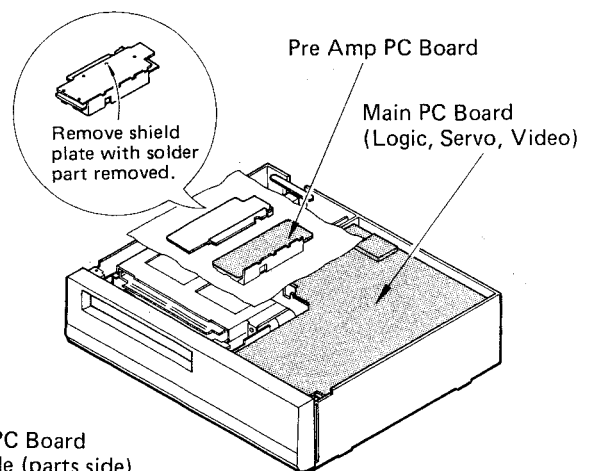
4. Standing PC Board for Servicing

Set each PC Board on the insulation plate or in the holder slot of cabinet, with each fixed screws removed. PC Boards below are shown in rear side (Solder side).

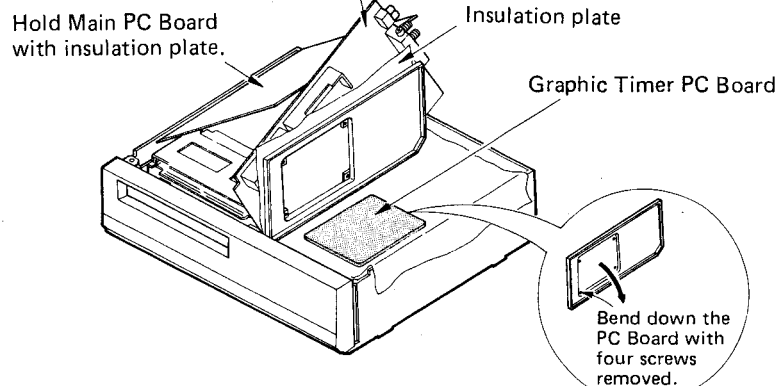
4-1. Timer, SW Control PC Board



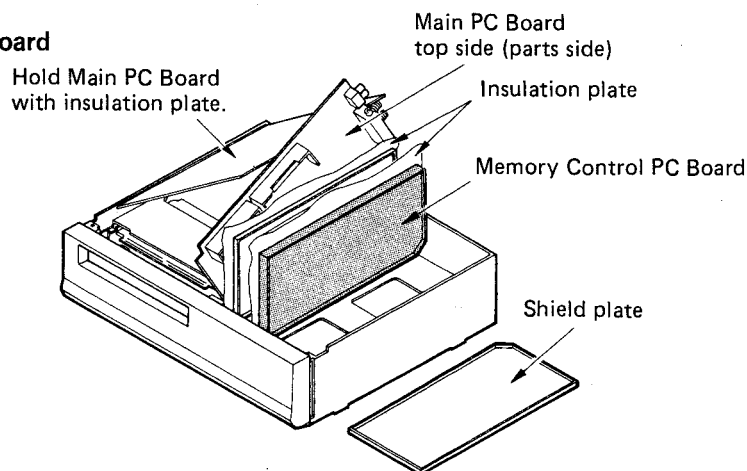
4-2. Main, Pre Amp PC Board



4-3. Graphic Timer PC Board

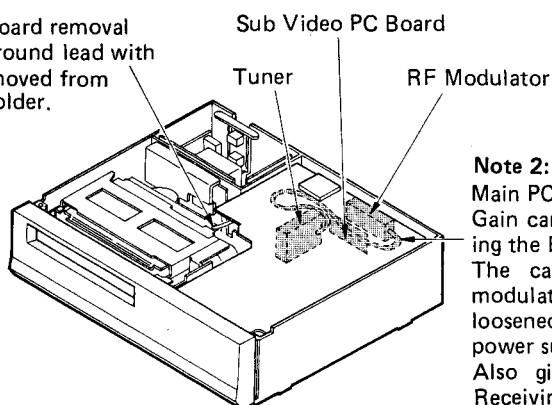


4-4. Memory Control PC Board



Note 1:

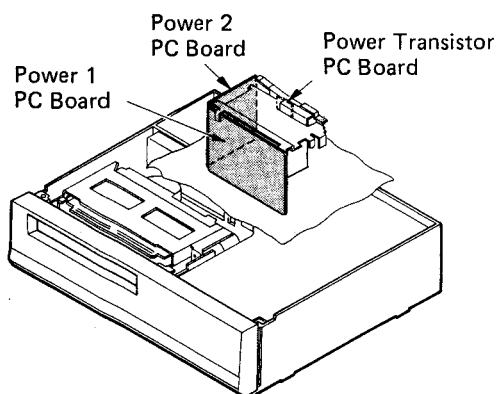
Main PC Board removal
Remove ground lead with screws removed from cassette holder.



Note 2:

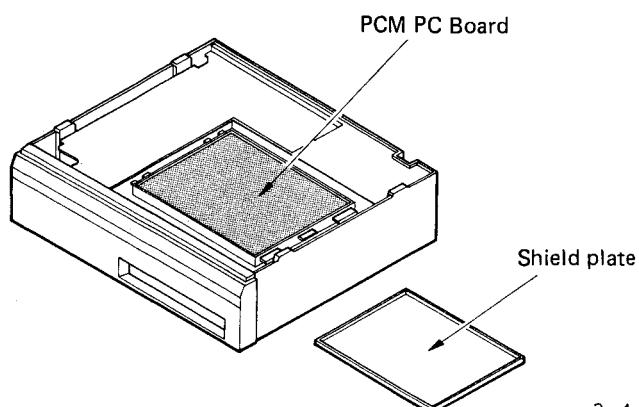
Main PC Board mounting
Gain care to location of coaxial cable connecting the RF Modulator and the tuner. The cable should be located between the modulator and the sub-video PC Board, and loosened at space between the tuner and the power supply.
Also give care to the cables when the TV Receiving PC Board is removed and remount it.

4-5. Power PC Board

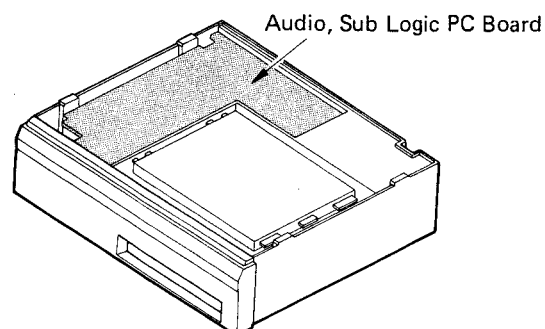


When removing power supply unit, remove the unit with connectors P807, P804, P805, P808 and P803 removed, and then connect the connectors.

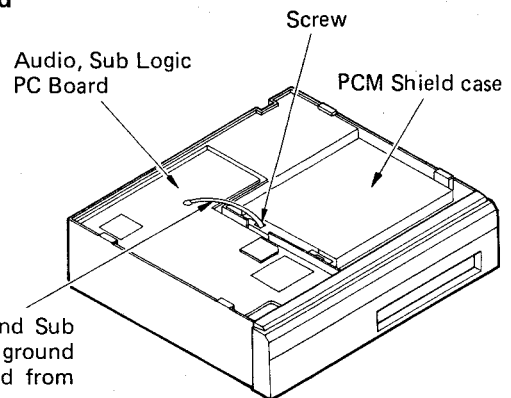
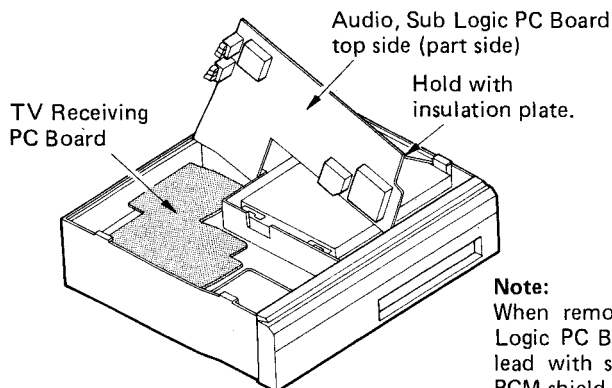
4-6. PCM PC Board



4-7. Audio, Sub Logic PC Board



4-8. TV Receiving (Tuner, PIF, MTS) PCM Power SW PC Board



Note:
When removing Audio and Sub Logic PC Board, remove ground lead with screws removed from PCM shield case.

4-9. Cautions

1. Solderless connector

Connectors bearing following number use solderless type. So, if excessive force is applied to the lead, it may be broken at the connected part.

Sufficient care will be given when handling the connectors.

Main PC Board, Logic Circuit (Connector No.)	PC Board Name (Connector No.)
(P604)	F/L PC Board (WF31)

2. Bottom plate (iron plate) screw mounting

Electrical performance will be lowered if the bottom plate is not fixed completely.

So when replacing the bottom plate, always mount it using all screws removed.

3. When servicing, always make sure the connector which connects the main PC Board and the preamplifier PC Board is not disconnected.

Precautions for Part Replacement

- In the schematic diagram, parts marked \triangle (ex. \triangle F801) are critical part to meet the safety regulations, so always use the parts bearing specified part codes (SN) when replacing them.
- Using the parts other than those specified shall violate the regulations, and may cause troubles such as operation failures, fire, etc.

Solid resistor indication

Resistor	1/8W film	P type film	U type film	Solid	Oxide film	Metal film	Cement	Fuse
Symbol	None	P	U	S	R	W	W	RF

Tolerance	$\pm 2\%$	$\pm 5\%$	$\pm 10\%$	$\pm 20\%$
Symbol	G	J	None	None

- All film type and oxide film type resistors used are $\pm 5\%$, so the tolerance symbol was not indicated for them.

Capacitor indication

Description	Symbol	Capacitance, unit	Capacitance allowance
Electrolytic	\pm	μ F	Not indicated
Special electrolytic			Indicated
Plastic film		μ F: indicated with numbers below decimal point	Indicated below $\pm 5\%$ (J), indicated below $\pm 0.5\mu$ F, not indicated for others
Ceramic		pF: indicated with numbers over decimal point	
Trimmer		pF	Not indicated

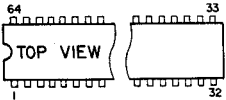
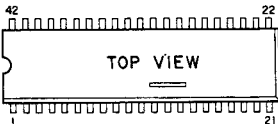
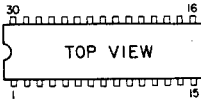
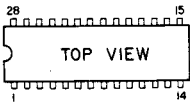
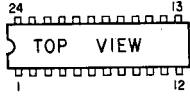
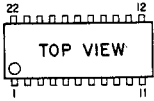

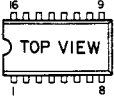
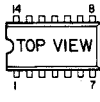
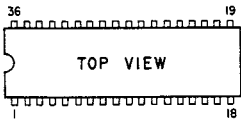
Note: No working voltage is indicated for capacitors rated at 50V except electrolytic capacitors.

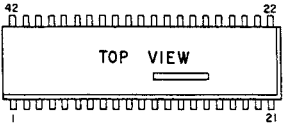
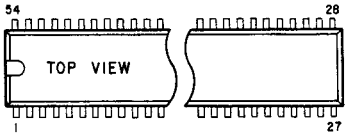
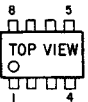
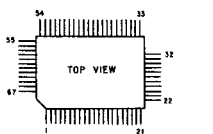
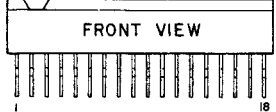
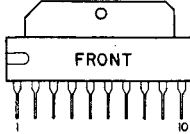
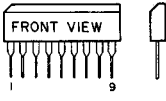
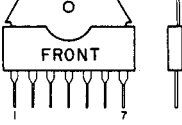
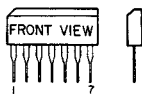
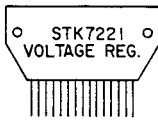
Waveform and voltage measurement

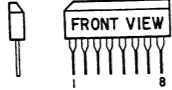
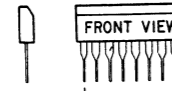
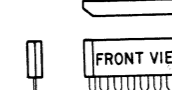




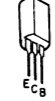

- Measurement of waveform and voltage at each section in the color circuits was conducted with sufficient service color bar signal being received and reproduced in normal conditions.
- Waveforms and voltage values for the remaining circuit were measured with a broadcasting signal normally received, so they may vary slightly according to the programs being received. Use them as a measure for servicing.
- All voltage values except the waveforms are expressed in DC and measured by a digital voltmeter.






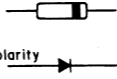
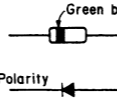
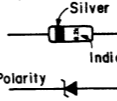

5. Part Configuration and their Symbols


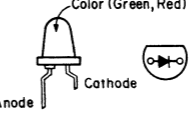
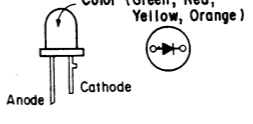

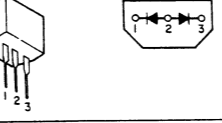
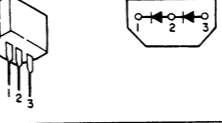
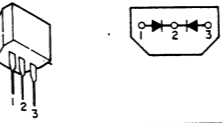
1. ICs

NAME	SHAPE
47C460AN9438 D75208CW-112	
TD6361N-D2 47C800N2227Z	
M51365SP, TD6709N TA8624N TA8604N TA8625N BA6800AS	
42C70N8116 TD6704P	
TA8606N TA8626N TA8502P TMM2015BP-15	
LA7090	
MB81416-12 TMM41464P-12	
TA8607P, TC4052BP, MB40576 TI.8708P, TC74HC157P, TC4053BP TC4538BP, MC10102P, TA8609P TA7772P, MC10138P, TA8619P TD6350P, MB40776, TC74HC161P TMM4164AP-12, TC74HC4538P	
TA75902P, LA6324, TC4011BP NJM2902N, TC74HC00P, TC74HC74P TC4066BP, TC74HC02P, TC74HC125P TA75339P, AN1319, TC74HC03P TC4030BP, TC74HC066P	
TA8627N	

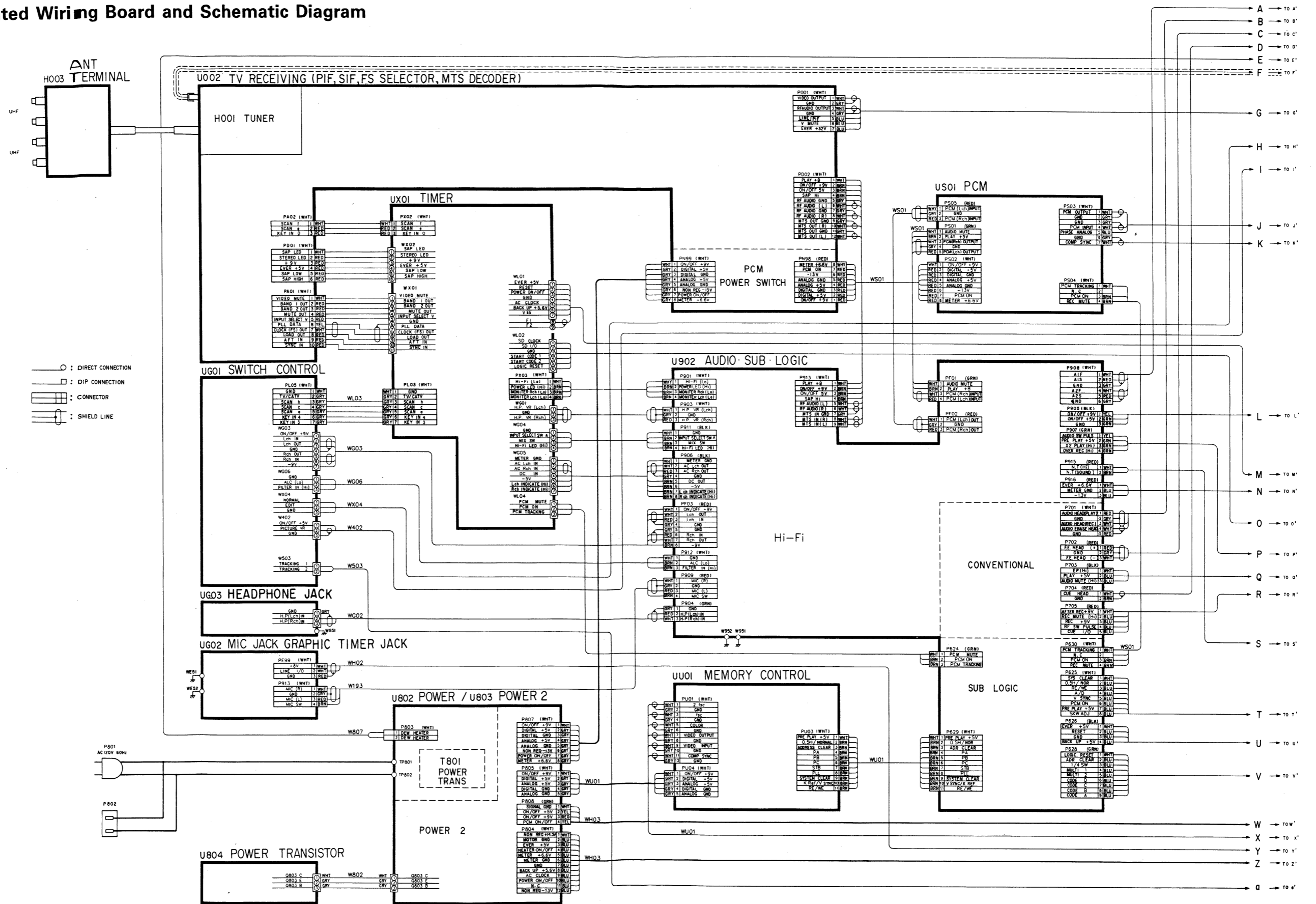
NAME	SHAPE
TGA8601	
TMS3475BNL	
NJM353D	
17G022AF0118 17G014AF0109	
BA7750AL	
TA7288P	
TA7348P, TA75393S TA7350P, UPC1474HA TA7365P, TA7320P TC5081AP NJM2068S	
TA7267P	
BA222 TA7361AP TA7347P TA7374P	
STK7241	

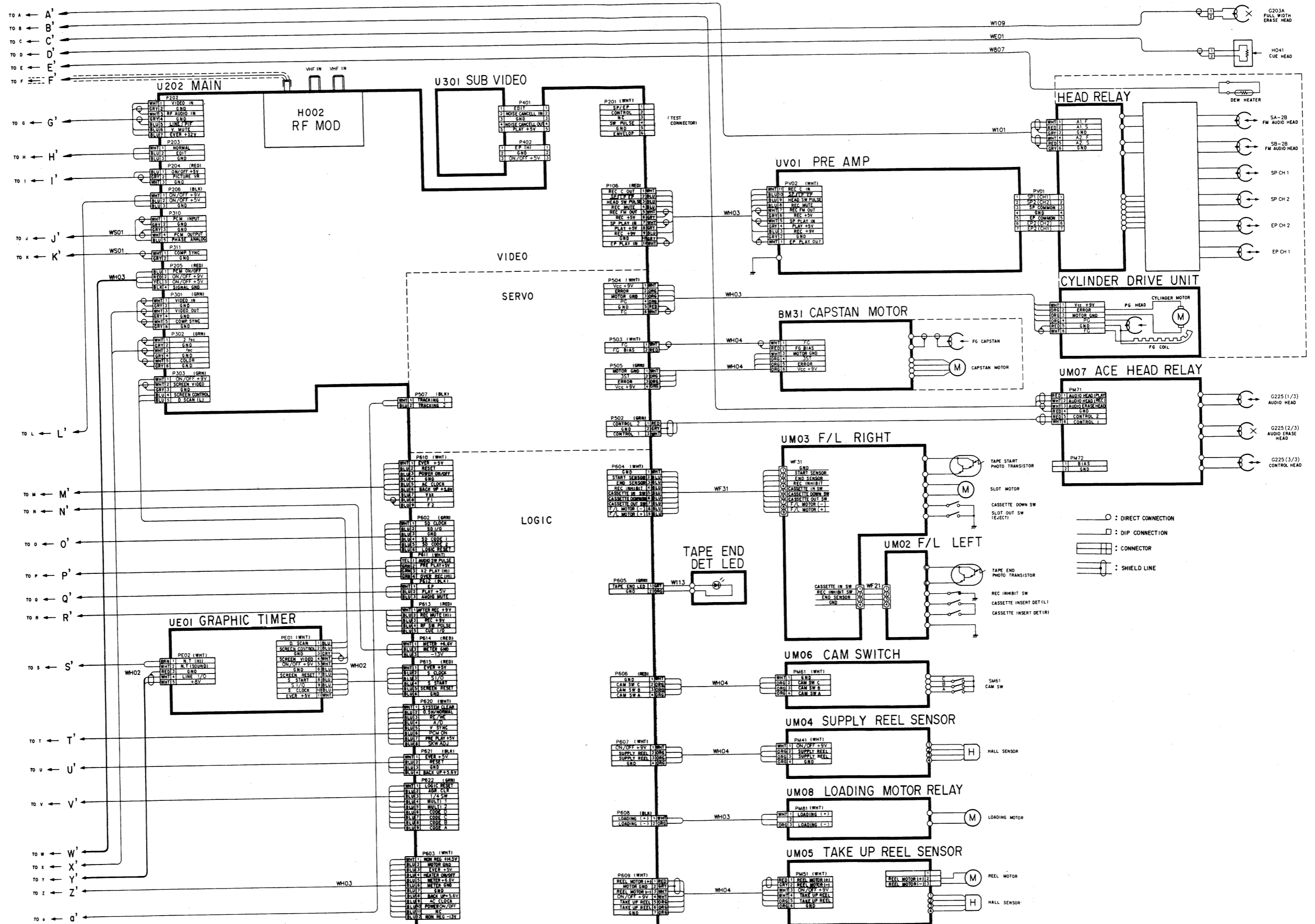
NAME	SHAPE
M5216L M50254P	
M5201L	
STA342M	
TA79L005P TA78L005AP TA79L009P	
TA79005P TA79010P	
2. TRANSISTORS	
NAME	SHAPE
2SC1923-O .2SC2878-A 2SC388ATM 2SA562TM-Y 2SC1959-Y 2SC1815-O	
2SK30ATM-GR	
2SA966-Y 2SC2236-Y 2SA1020-Y	
2SA1048-Y .RN1204 .2SC2458BL 2SC2458-Y .RN1203 .RN1206 RN2204 .RN2205 .RN2203 RN1201 .2SC2668-Y .RN1205 RN1202 .RN2202 .RN2201	

NAME	SHAPE
2SD549	
2SD1198A-Q	
2SD686 2SB834-Y	
2SA1015-Y 2SD1405-BL	
PN202S-S.TH PN202S-R.TH	
3. DIODES	
NAME	SHAPE
1S1555(TV)	
1SS176 1SS99 1SS177 1SS132	
05Z7.5X .05Z5.6Y 05Z5.1X .05Z8.2X 05Z3.9Y .ERC01-02FL 05Z13Y EQA02-05D	
UPC574J	

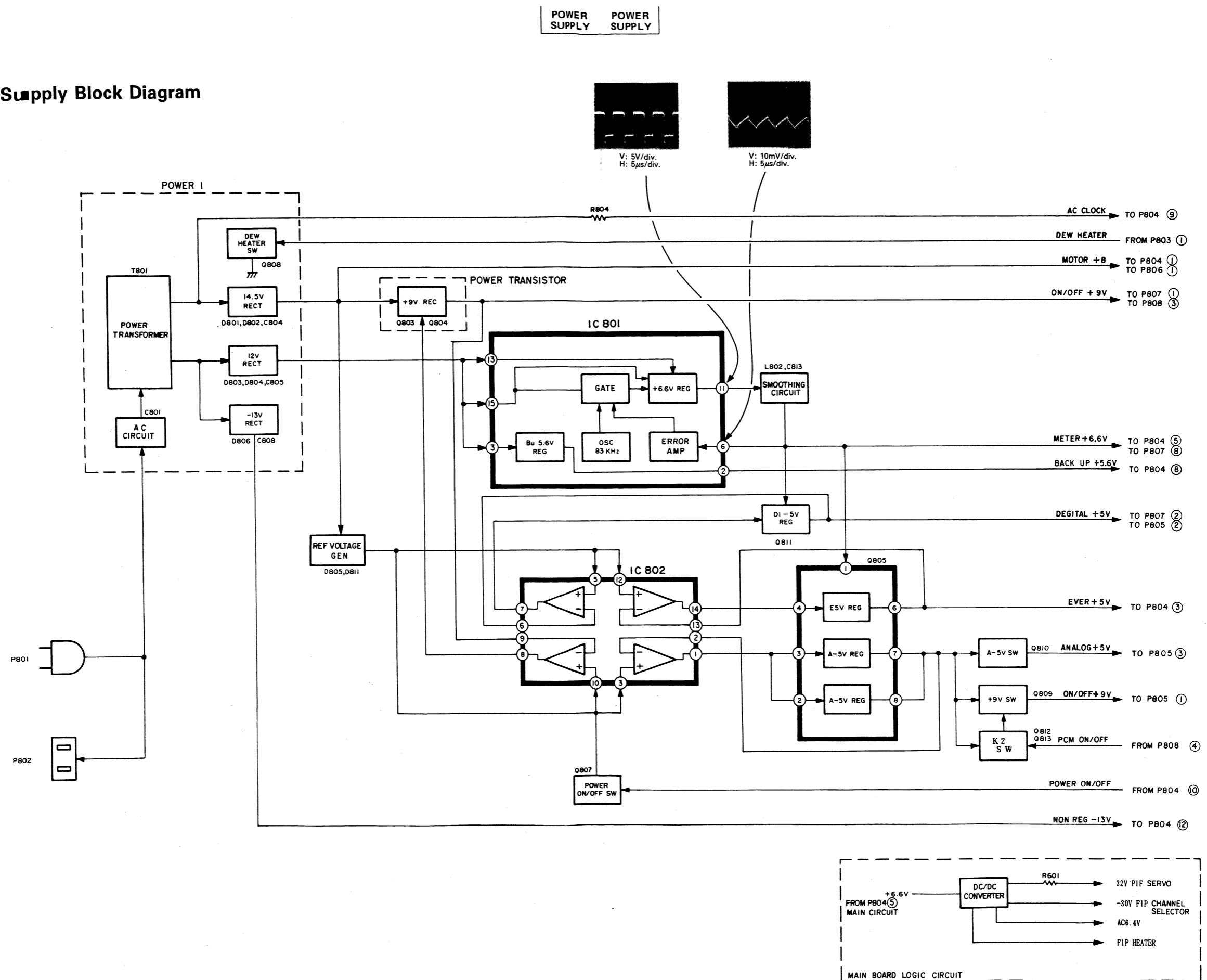
NAME	SHAPE
PII-302	
TLUG163 TLO163	
GL450V TLUR163 TLG113(FA)	
1B2Z1	
1SS200	
1SS227	
1SS201	

6. Printed Wiring Board and Schematic Diagram

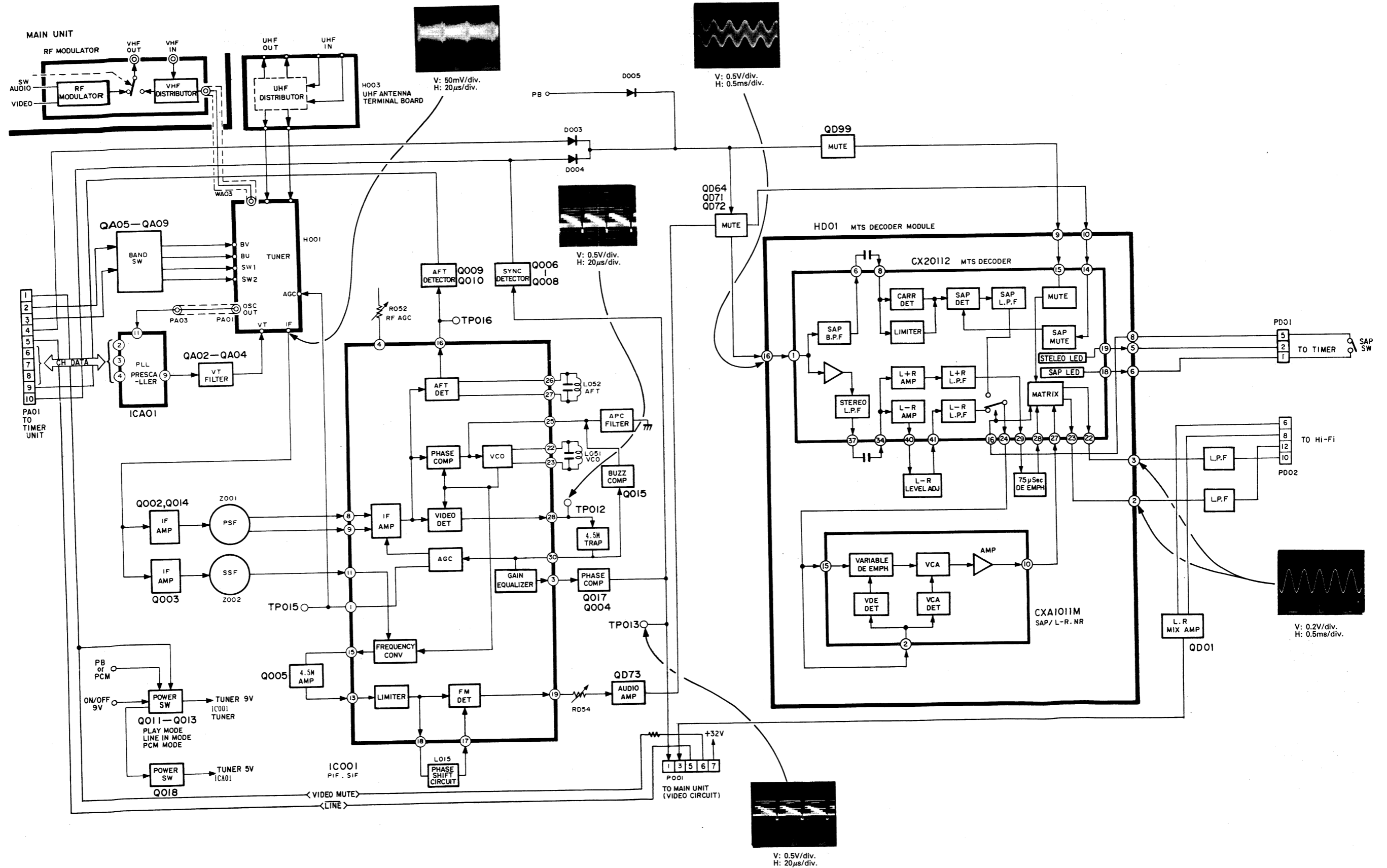




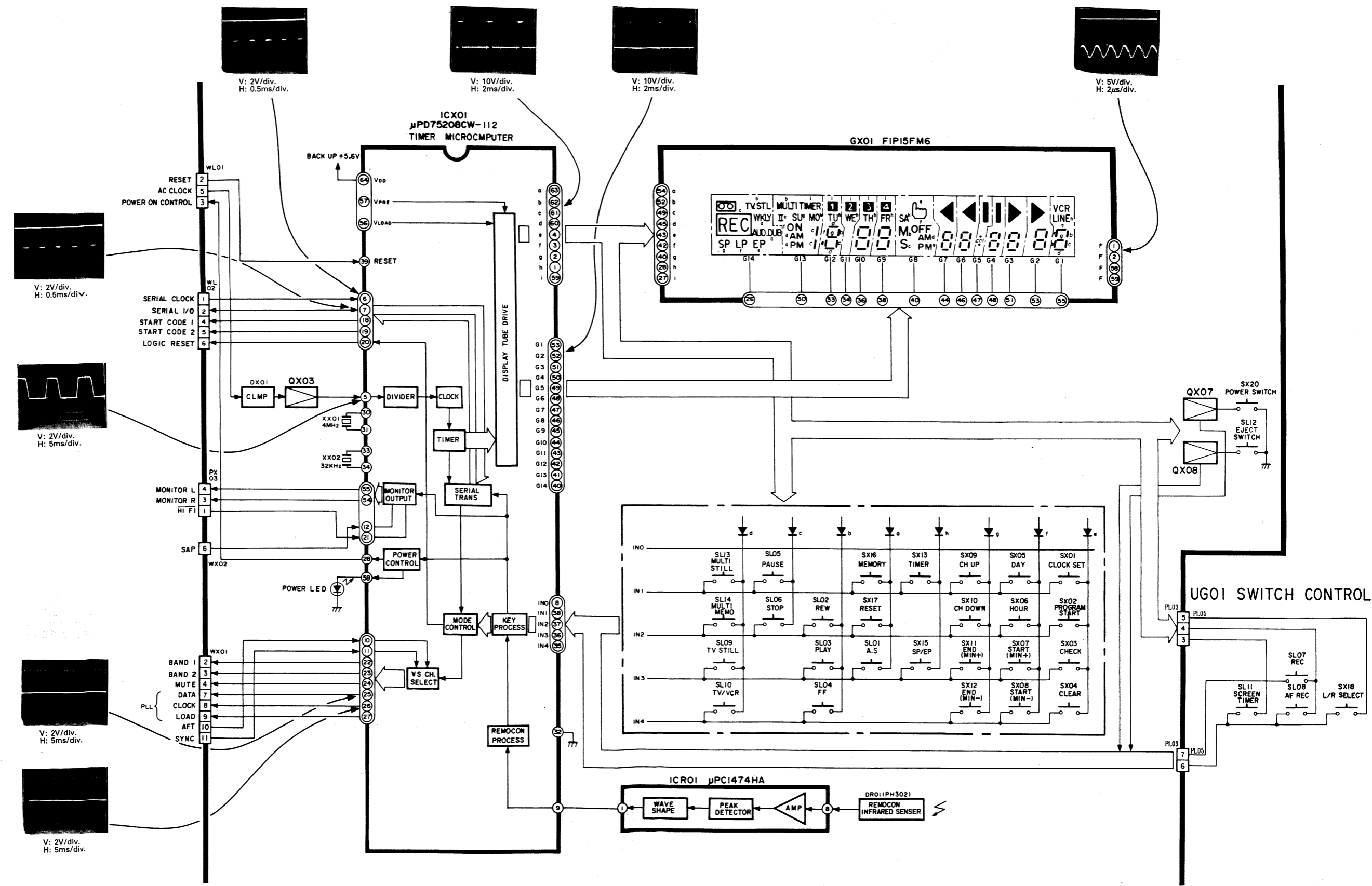
7-1. Power Supply Block Diagram

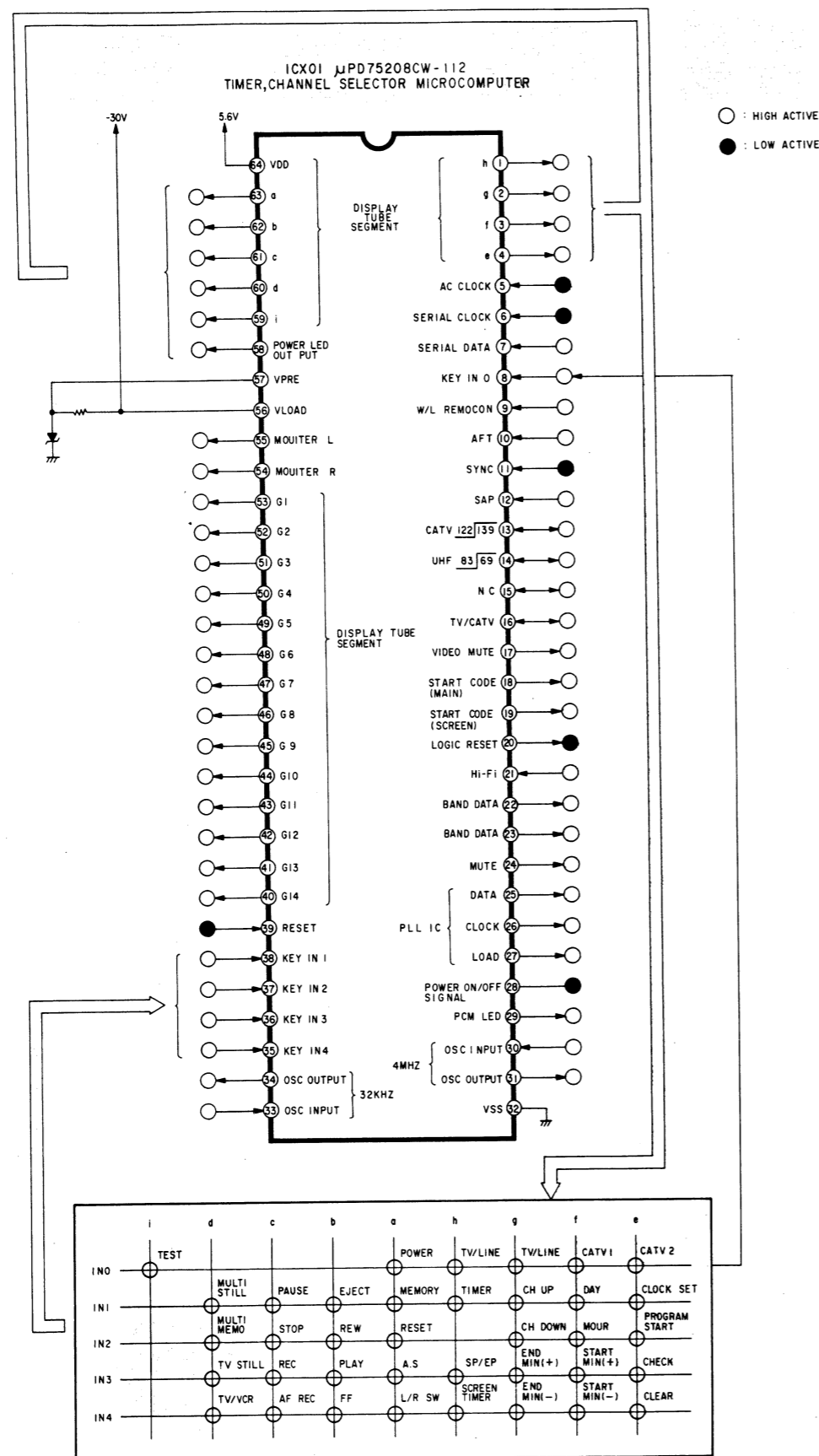


8-1. TV Receiving Block Diagram (Tuner, PIF, MTS)

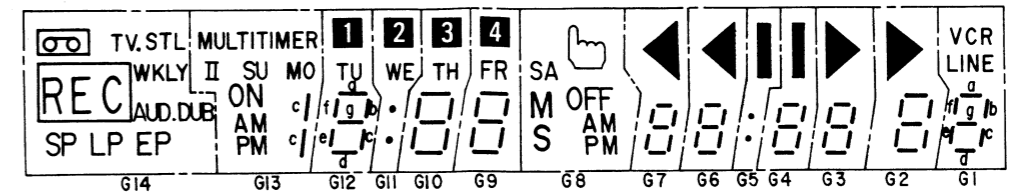


9-1. Timer, Display Block Diagram





GX01 FIP15FM6

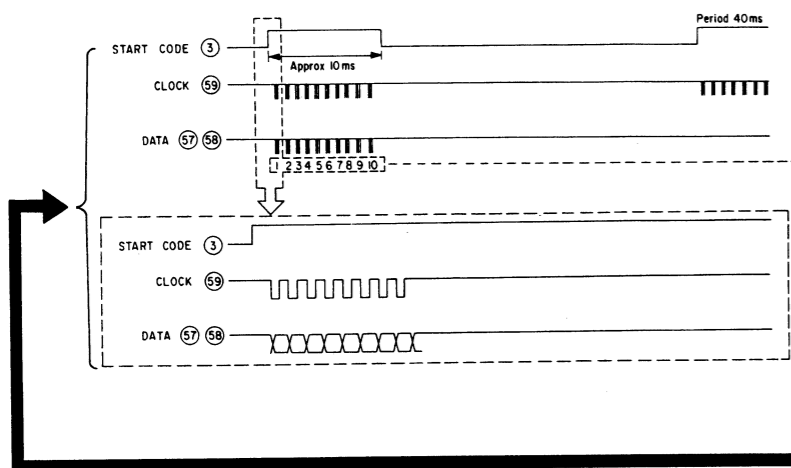


Display Pattern

	G14	G13	G12	G11	G10	G9	G8	G7	G6	G5	G4	G3	G2	G1
a	WKLY	PM	a	col	a	a	PM	a	a	col	a	a	a	a
b	TV.STL	MULTI	b	/	b	b	M	b	b	/	b	b	b	b
c	REC	c	c	/	c	c	S	c	c	/	c	c	c	c
d	AUDDUB	AM	d	/	d	d	AM	d	d	/	d	d	d	d
e	EP	II	e	/	e	e	hand	e	e	/	e	e	e	e
f	LP	ON	f	/	f	f	OFF	f	f	/	f	f	f	f
g	SP	SU	g	/	g	g	/	g	g	/	g	g	g	g
h	TV	MO	TU	WE	TH	FR	SA	◀	◀			▶	▶	LINE
i	/	TIMER	1	2	3	4	/	/	/	/	/	/	/	VCR

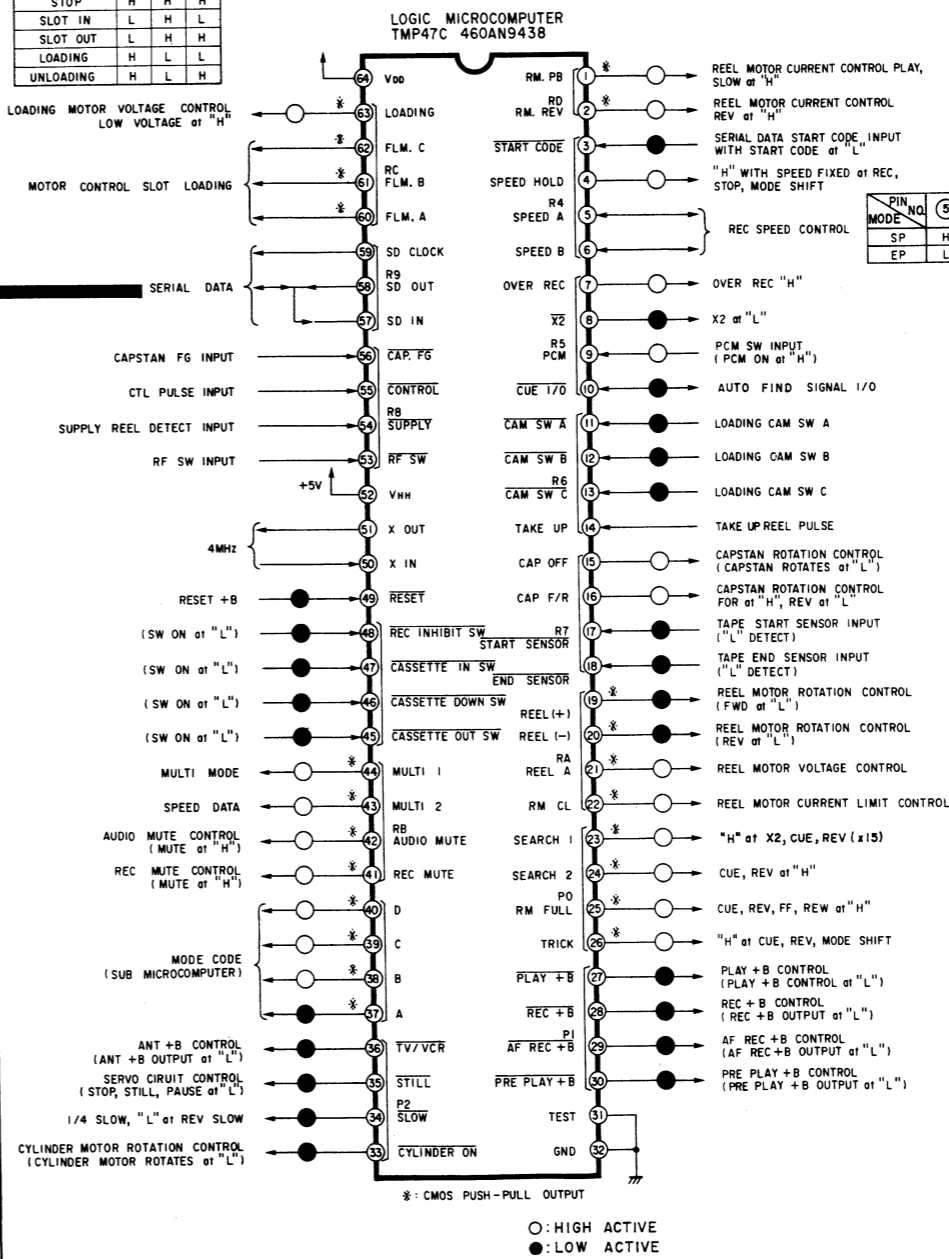
LOGIC LOGIC





NO.	Transmit Micro Computer	DATA
1	TIMER	POWER ON/OFF, COUNTER MEMORY, AVI
2	LOGIC	MODE DATA, TAPE SPEED, REC INHIBIT, DISPLAY
3	TIMER	TV/VCR, KEY DATA
4	LOGIC	COUNTER MODE, MODE DATA
5	TIMER	COUNTER, BACK UP
6	LOGIC	COUNTER
7	TIMER	COUNTER, BACK UP
8	LOGIC	COUNTER
9	TIMER	CHECK, SUM
10	LOGIC	CHECK, SUM

PIN NO.	(60)	(61)	(62)
MODE			
STOP	H	H	H
SLOT IN	L	H	L
SLOT OUT	L	H	H
LOADING	H	L	L
UNLOADING	H	L	H



Logic mode shift table (1)

Current mode	Input	Eject	REC
SLOT IN		○	×
SLOT OUT		×	×
STOP		○	○
PLAY		○	×
FF PLAY		○	×
REW PLAY		○	×
FF		○	×
REW		○	×
STILL PICTURE		○	REC PAUSE
REC		×	—
REC PAUSE		×	×
AF REC		×	×
AF REC PAUSE		×	×
X2 PLAY		○	×
1/4 SLOW		○	×
REV SLOW		○	×
TIMER REC		×	×
TV STILL (STOP)		**	○
ON Screen Program (OSP)		**	○

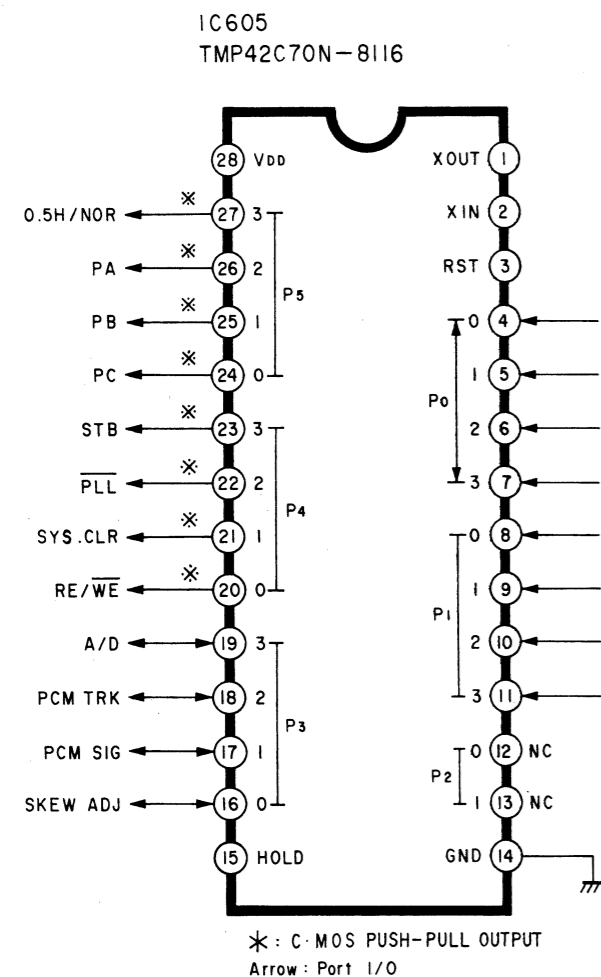
Note: 1/4 SLOW, REV SLOW and X2 PLAY mod
* : When being pushed, run a tape

IC601 Output polarity

PIN NO.	MODE	SLOT IN	SLOT OUT	LOADING	UN-LOADING	STOP	FF	REW	PLAY	X2	STILL	1/4 SLOW	REV SLOW	CUE EP×15	REVIEW EP×15	REC	REC PAUSE	AF REC	AF REC PAUSE	TV STILL	POWER OFF	EE MULTI SERIES(STOP)
1	RM. PB	L	L	L	L	L	L	L	H	L	L	H	L	L	L	H	L	H	L	L	L	L
2	RM. REV	L	L	H	L	L	L	L	L	L	H	L	L	L	L	H	L	L	L	L	L	L
4	SPEED HOLD	H	H	H	H	H	H	H	L	L	H	L	L	L	L	H	H	L	H	H	H	H
7	OVER REC	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L
8	X2	H	H	H	H	H	H	H	H	L	H	H	H	H	H	H	H	H	H	H	H	H
10	CUE I/O	H	H	H	H	H	H	H	H	H	H	H	H	H	H	L	H	H	H	H	H	H
15	CAP OFF	H	H	H	H	H	H	H	L	L	H	L	L	L	L	L	H	H	H	H	H	H
16	CAP F/R	H	H	H	H	H	H	H	H	H	H	H	H	H	H	L	H	H	L	H	H	H
19	REEL(+)	H	H	L	H	H	L	H	H	L	H	H	L	H	L	H	H	H	H	H	H	H
20	REEL(-)	H	H	L	L	H	H	L	H	H	L	H	L	H	L	H	H	H	H	H	H	H
21	REEL A	H	H	L	L	L	L	L	L	L	H	L	L	L	L	H	L	L	L	L	L	L
22	PM. CL	L	L	L	H	L	L	L	H	L	L	L	L	L	L	H	L	L	L	L	L	L
23	SEARCH 1	L	L	L	L	L	L	L	L	L	L	L	L	L	L	H	L	L	L	L	L	L
24	SEARCH 2	L	L	L	L	L	L	L	L	L	L	L	L	L	L	H	L	L	L	L	L	L
25	RM. FULL	L	L	L	L	L	H	H	L	L	L	L	L	L	L	H	L	L	L	L	L	L
26	TRICK	L	L	L	L	L	L	L	L	L	L	L	L	L	L	H	L	L	L	L	L	L
27	PLAY+B	H	H	H	H	H	H	H	L	L	L	L	L	L	L	L	H	H	L	L	H	H
28	REC+B	H	H	H	H	H	H	H	H	H	H	H	H	H	H	L	L	H	H	H	H	H
29	AF REC+B	H	H	H	H	H	H	H	H	H	H	H	H	H	H	L	L	H	L	H	H	H
30	Pre PLAY+B	H	H	H	H	H	H	H	L	L	L	L	L	L	L	L	H	H	L	L	H	H
33	DRUM ON	H	H	L	L	H	H	H	L	L	L	L	L	L	L	L	L	L	L	H	H	H
34	SLOW	H	H	H	H	H	H	H	H	H	L	L	L	L	L	H	H	L	L	L	L	L
35	STILL	L	L	L	L	L	L	L	L	L	L	L	L	L	L	H	L	L	L	L	L	L
36	TV/VTR																					
37	A	L	L	L	L	L	L	L	H	L	L	SP	EP	SP	EP	L	L	L	L	H	L	L
38	B	L	L	L	L	L	L	L	L	L	H	L	L	L	L	L	H	L	L	H	L	L
39	C	L	L	L	L	L	L	L	H	H	L	L	L	L	L	L	H	L	L	H	L	L
40	D	L	L	L	L	L	L	L	H	H	L	L	L	L	L	L	H	L	L	H	L	L
41	REC MUTE	H	H	H	H	H	H	H	H	H	H	H	H	H	H	L	L	L	L	H	H	H
42	AUDIO MUTE	L	L	L	L	L	L	L	L	L	H	H	H	H	H	L	L	L	L	H	L	L
43	MULTI 2	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L
44	MULTI 1	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L

Logic mode shift table (2)

Previous mode	Key input	Multi ser
EE mode	STOP	Lo
	Multi Series	Lo
	Multi Series	M
	Multi Series	Hi
	Memo	1
	Memo	2
	Memo	3
	Memo	4
	Multi still Lo.M.Hi	○
	TV still	○
PLAY mode	PLAY	○
	Multi series	Lo
	Multi series	M
	Multi series	Hi
	Memo	1
	Memo	2
	Memo	3
STILL mode	Memo	4
	Multi still Lo.M.Hi	○
	STILL	○
SLOW mode	SLOW	○
	Multi series	Lo
	Multi series	M
	Multi series	Hi
REV SLOW mode	REV SLOW	○
	Multi series	Lo
	Multi series	M
	Multi series	Hi
	x2	×
	FF/REW	○
	CUE/REV	×
	REC. AF REC	×



MULTI 1, MULTI 2			
MODE	SPEED	MULTI 1	MULTI 2
MULTI STILL MULTI SERIES	Lo	0	1
	M	1	0
	Hi	1	1
etc.	—	0	0

SUB-μCOM CODE TABLE

No.	CODE				MODE
	D	C	B	A	
0	0	0	0	0	EE(STOP, FF, REW) CUE/REV
1	0	0	0	1	When mode Shifts
2	0	0	1	0	STILL, AF REC PAUSE
3	0	0	1	1	MULTI STILL
4	0	1	0	0	MULTI MEMO1
5	0	1	0	1	MULTI MEMO2
6	0	1	1	0	MULTI MEMO3
7	0	1	1	1	MULTI MEMO4
8	1	0	0	0	SP.FWD.SLOW
9	1	0	0	1	EP.FWD.SLOW
A	1	0	1	0	SP.REV.SLOW
B	1	0	1	1	EP.REV.SLOW
C	1	1	0	0	X2
D	1	1	0	1	PLAY. AF REC
E	1	1	1	0	REC
F	1	1	1	1	TV. STILL

SUB Microcomputer mode output table

Terminal	PCM SW ON		PCM SW OFF											Mode shift				
	PLAY REC	Others	PLAY EE REC	Still	X2	SLOW	Multi still	Multi series		Multi Memo								
								EE.PLAY	EP SLOW	Memo 1		Memo 2			Memo 3		Memo 4	
15 SKW ADJ	L	L	L	L	L	L	L	EE.PLAY SP SLOW	EP SLOW	L	L	L	L	Output of previous mode is output.				
18 PCM TRK	OPEN	L	L	L	L	L	L	L		L	L	L	L					
19 A/D	H	H	H	L	L	L		L		H	H	H	L					
20 RE/WE	L	L	L	H	H	H		EE	PLAY.SLOW	EE	PLAY	EE	PLAY		H			
21 SYS. CLR	L	L	L	H	H	H	H	L	H	L	H	L	H					
22 PLL	L	L	L	H	H	H												
23 STB	L	L	L															
24 PC	L	L	L	H	H	H				L			L					
25 PB	L	L	L	H	H	H												
26 PA	L	L	L	L	L	L					L							
27 0.5H/NOR	L	L	L	* 1	L	SP H	EP L	H	H	H	H	H	H					

* Decided by the previous mode.
X2, EP SLOW: "L"
Others: "H"

SERIAL


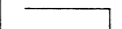
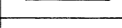

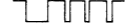


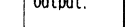




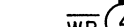















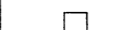









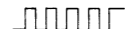


















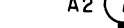
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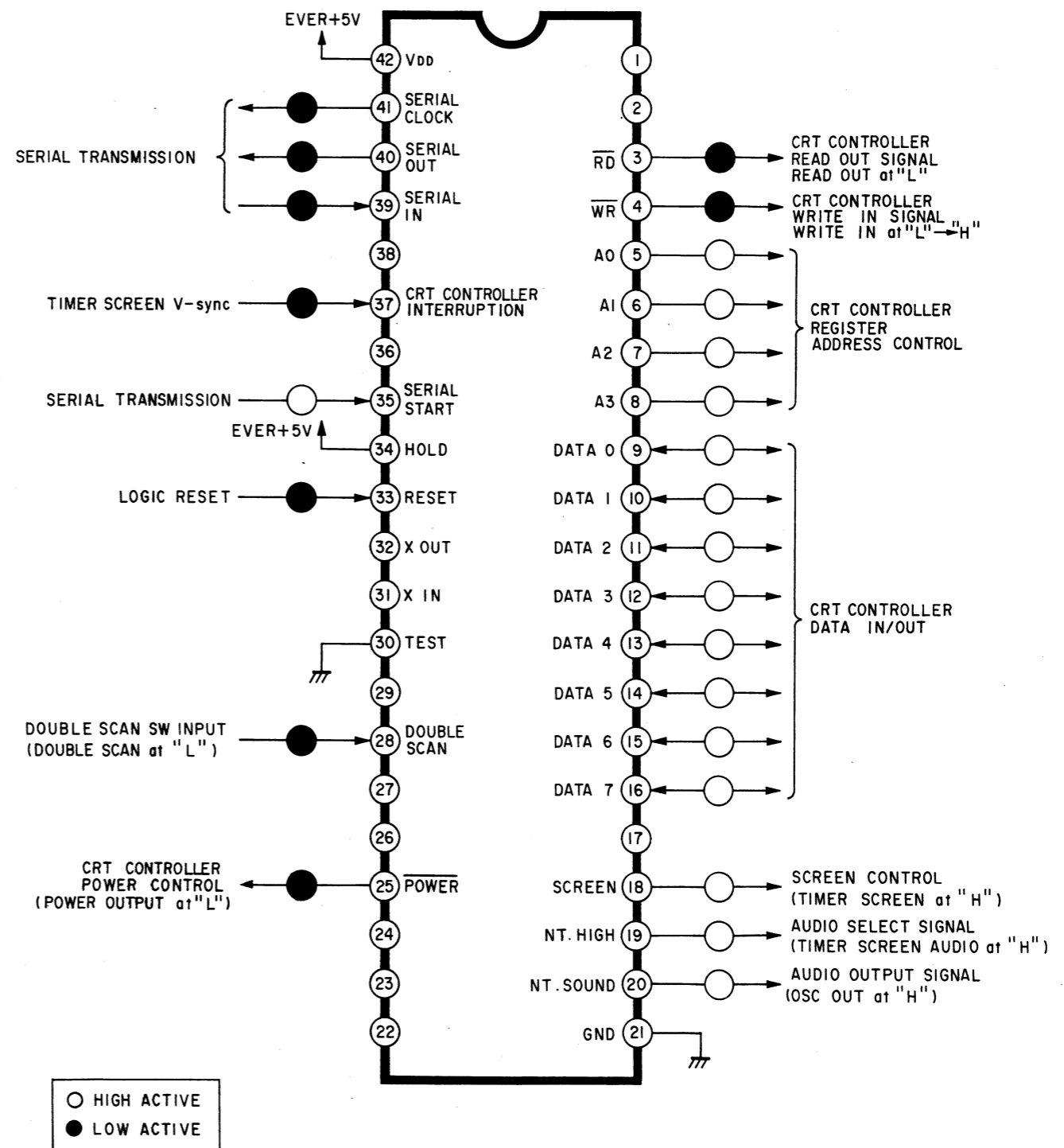
(POV

SUB Microcomputer mode output table

Terminal		PCM SW ON		PCM SW OFF										Mode shift					
		PLAY REC	Others	PLAY EE. REC	Still	X2	SLOW	Multi still	Multi series		Multi Memo								
									EE. PLAY SP SLOW	EP SLOW	Memo 1		Memo 2		Memo 3		Memo 4		Output of previous mode is output.
19	SKW ADJ	L	L	L	L	L	L	L	L		L	L	L	L	L	L	L	L	
18	PCM TRK	OPEN	L	L	L	L	L	L	L		L	L	L	L	L	L	L	L	
19	A/D	H	H	H	L	L	L		L		H	H	H	H	H	H	H	L	
20	RE/WE	L	L	L	H	H	H		EE	PLAY SLOW	EE	PLAY	EE	PLAY	EE	PLAY	H		
21	SYS. CLR	L	L	L	H	H	H	H	H		H	H	H	H	H	H	H	H	
22	PLL	L	L	L	H	H	H												
23	STB	L	L	L															
24	PC	L	L	L	H	H	H			L								L	
25	PB	L	L	L	H	H	H												
26	PA	L	L	L	L	L	L				L								
27	0.5H/NOR	L	L	L	* 1	L	SP H EP L	H	H		H	H	H	H	H	H	H	H	

* Decided by the previous mode.
X2, EP SLOW: "L"
Others: "H"

ICE01 TMP47C800N2227
GRAPHIC TIMER MICROCOMPUTER

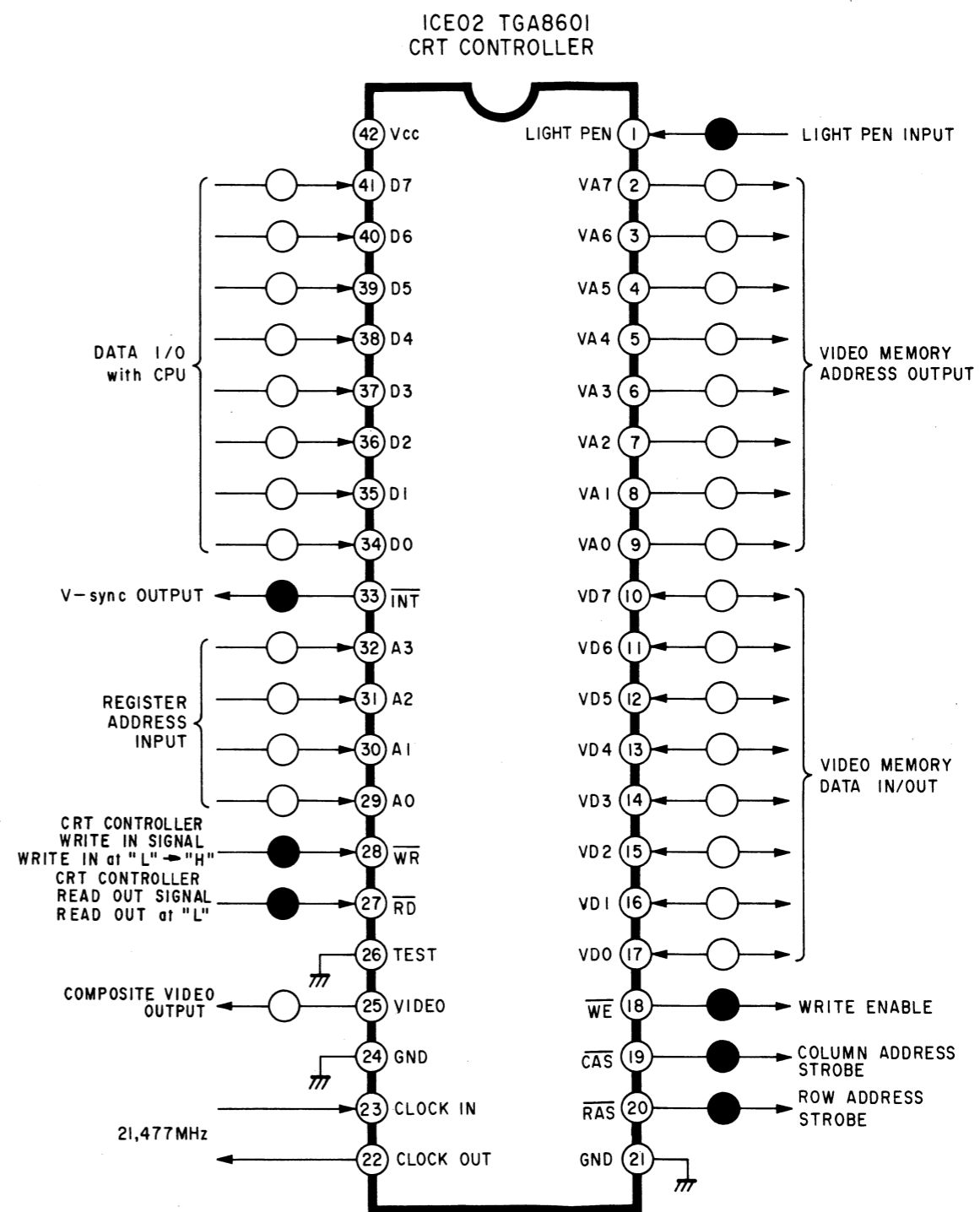
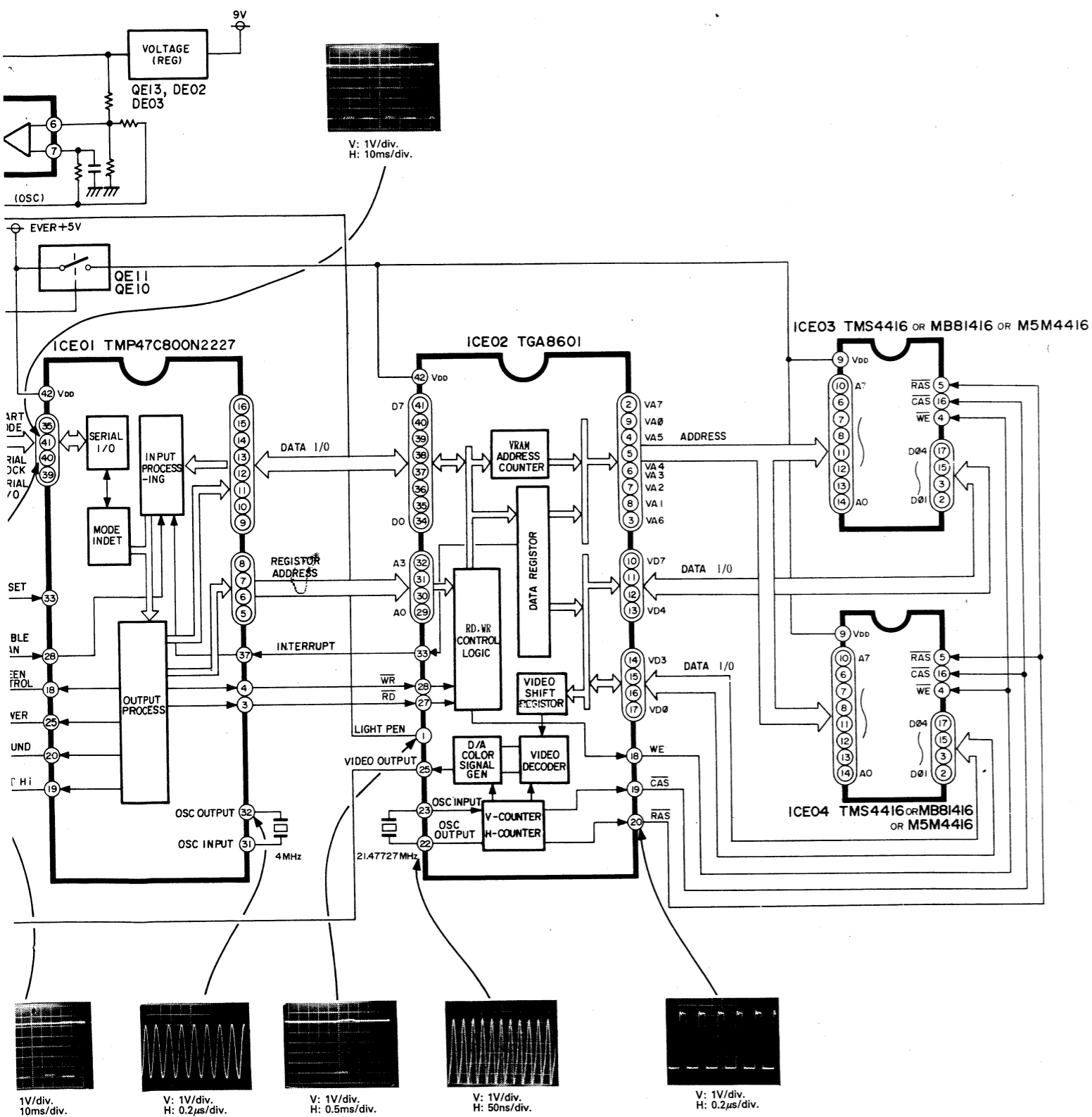




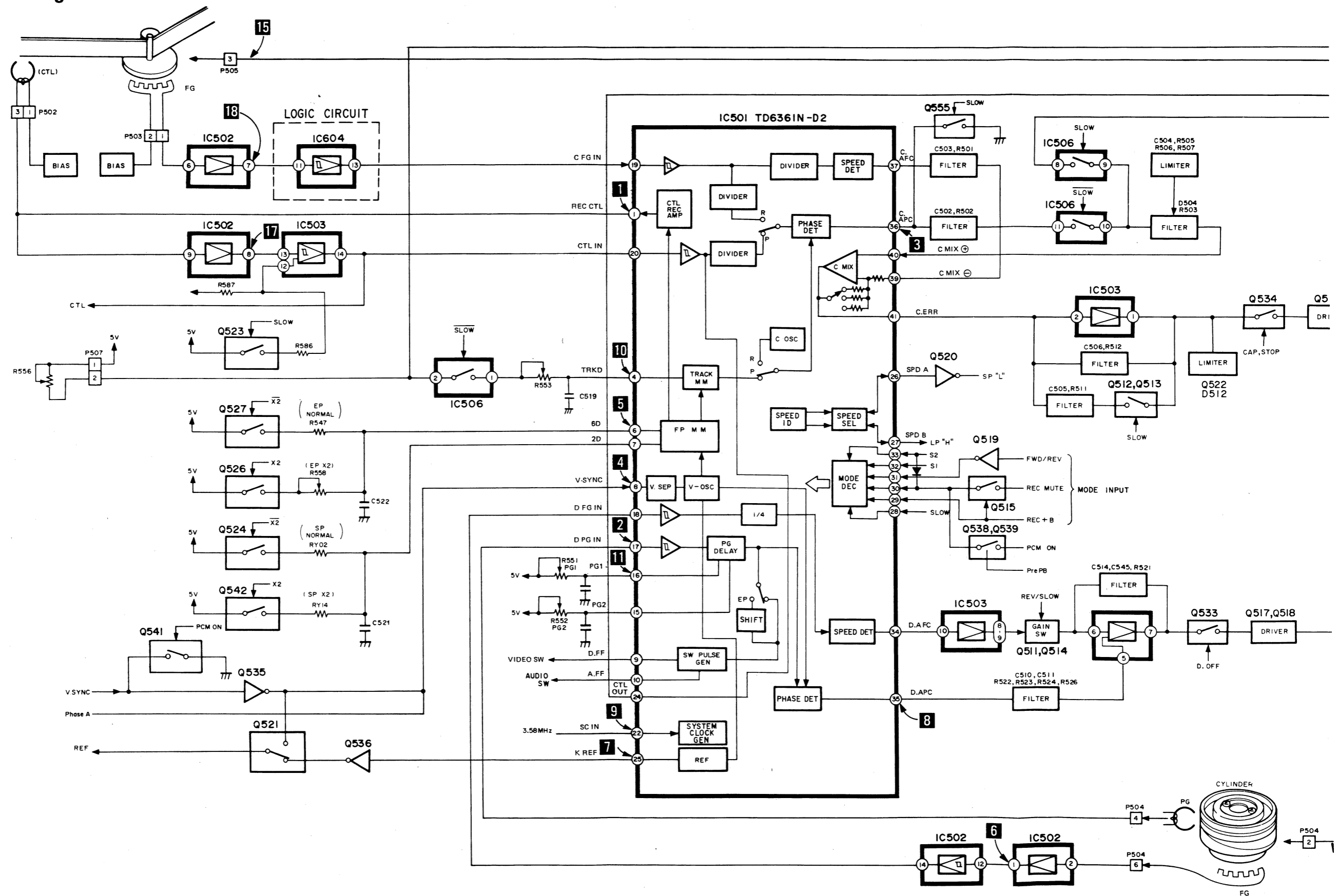
V: 1V/div.
H: 0.5ms/div.

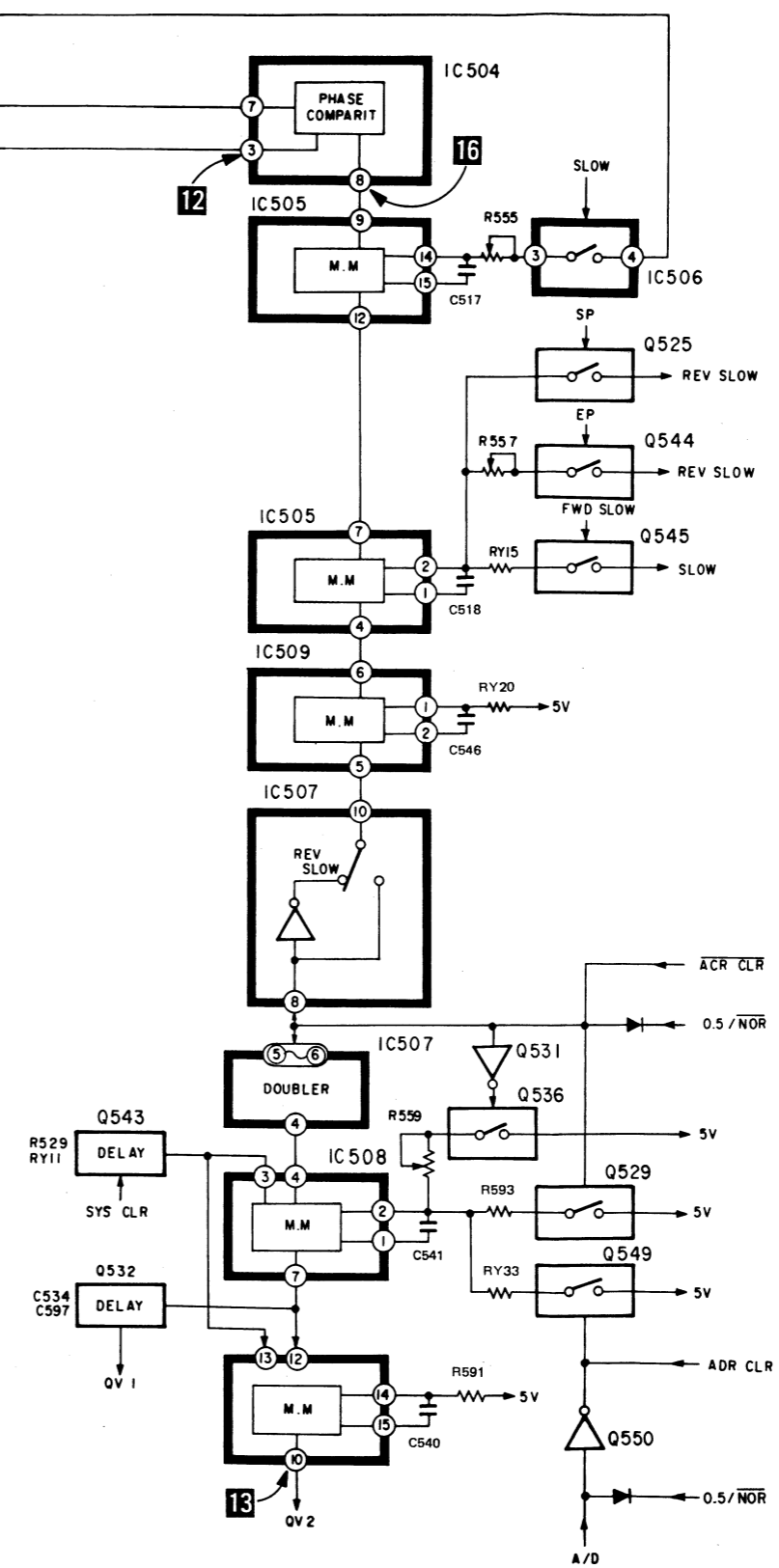
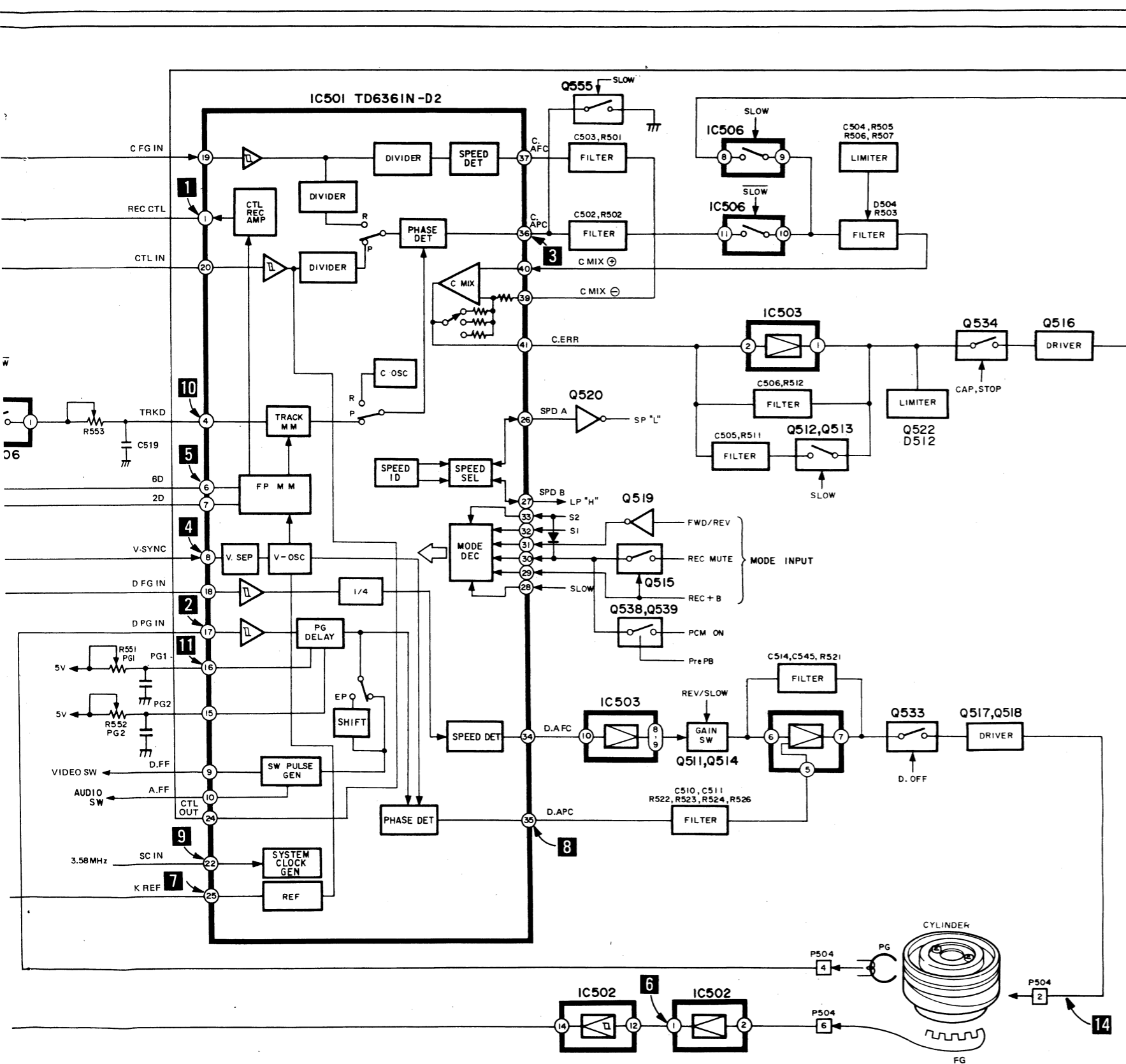
V: 1V/div.
H: 0.5ms/div.



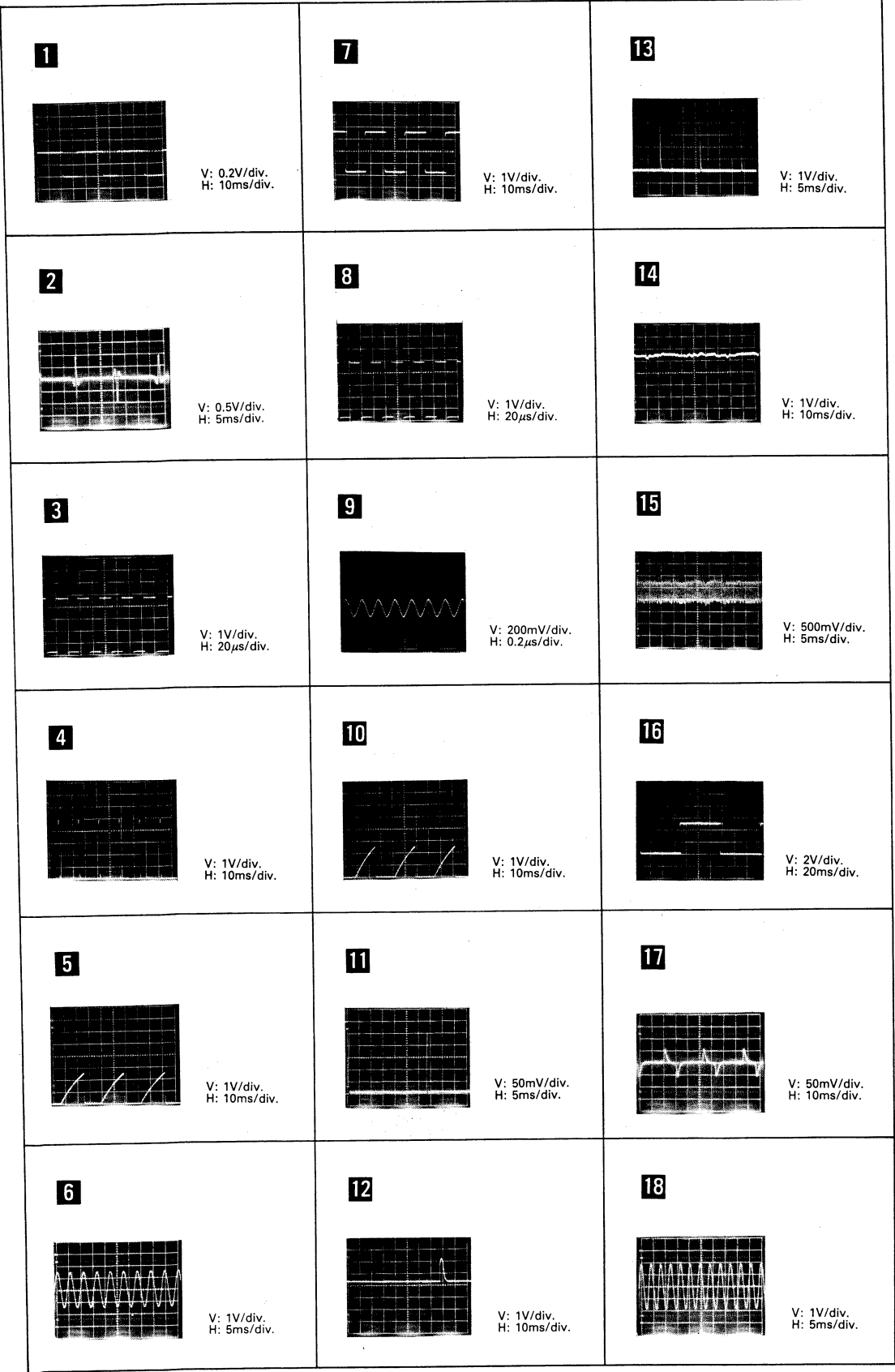


12-1. Servo Block Diagram





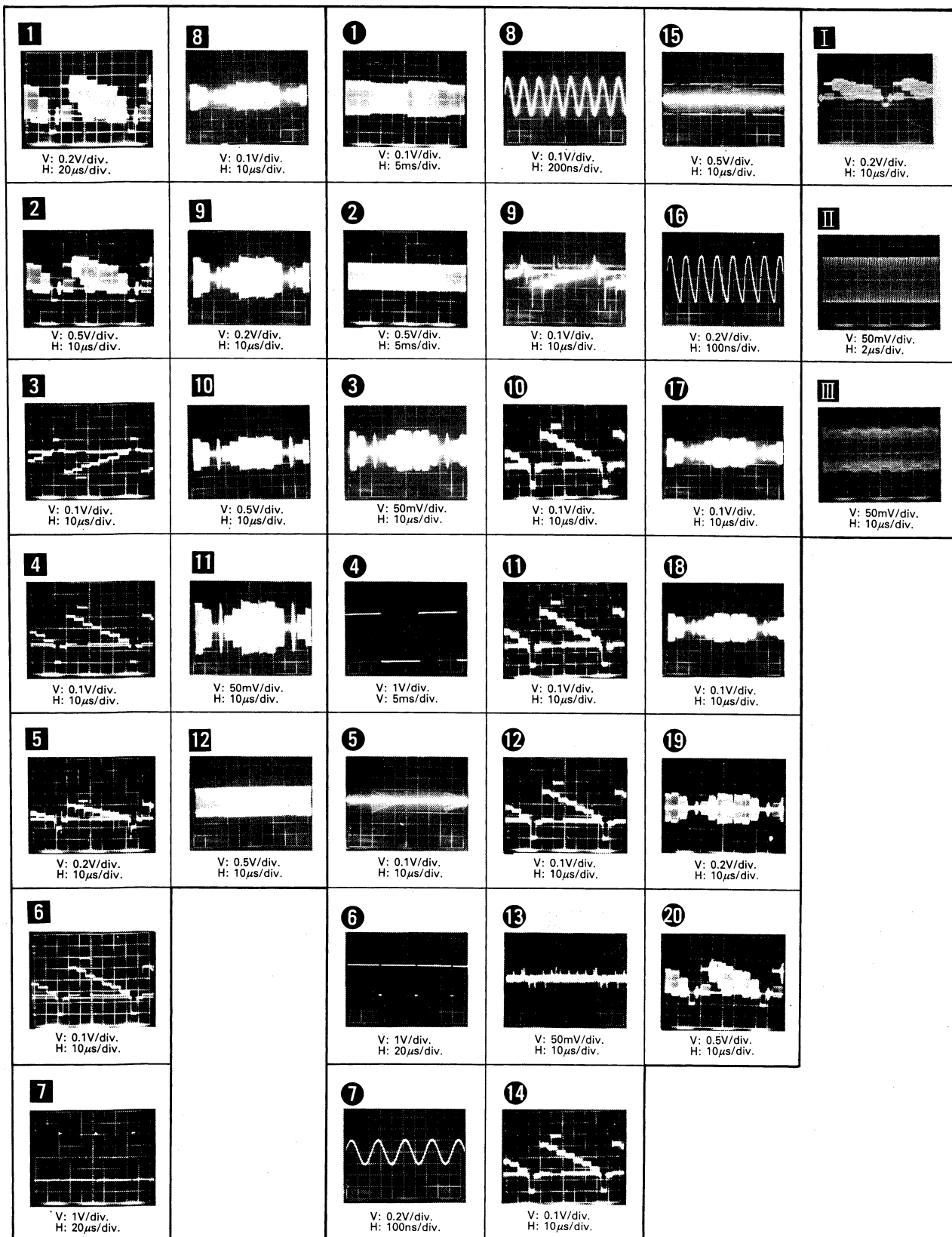
Servo Block Diagram (Waveforms)



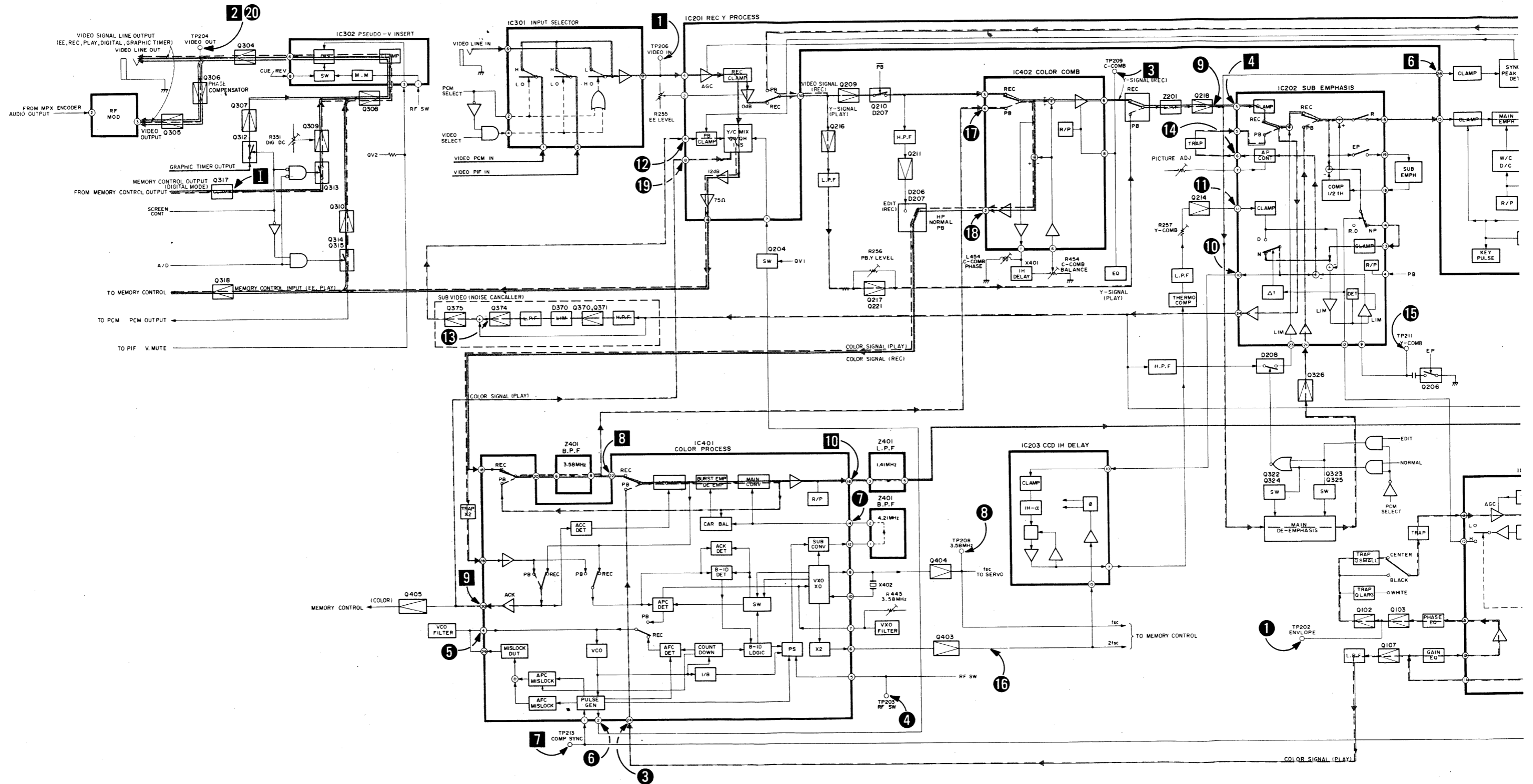
Video Block Diagram (Waveforms)

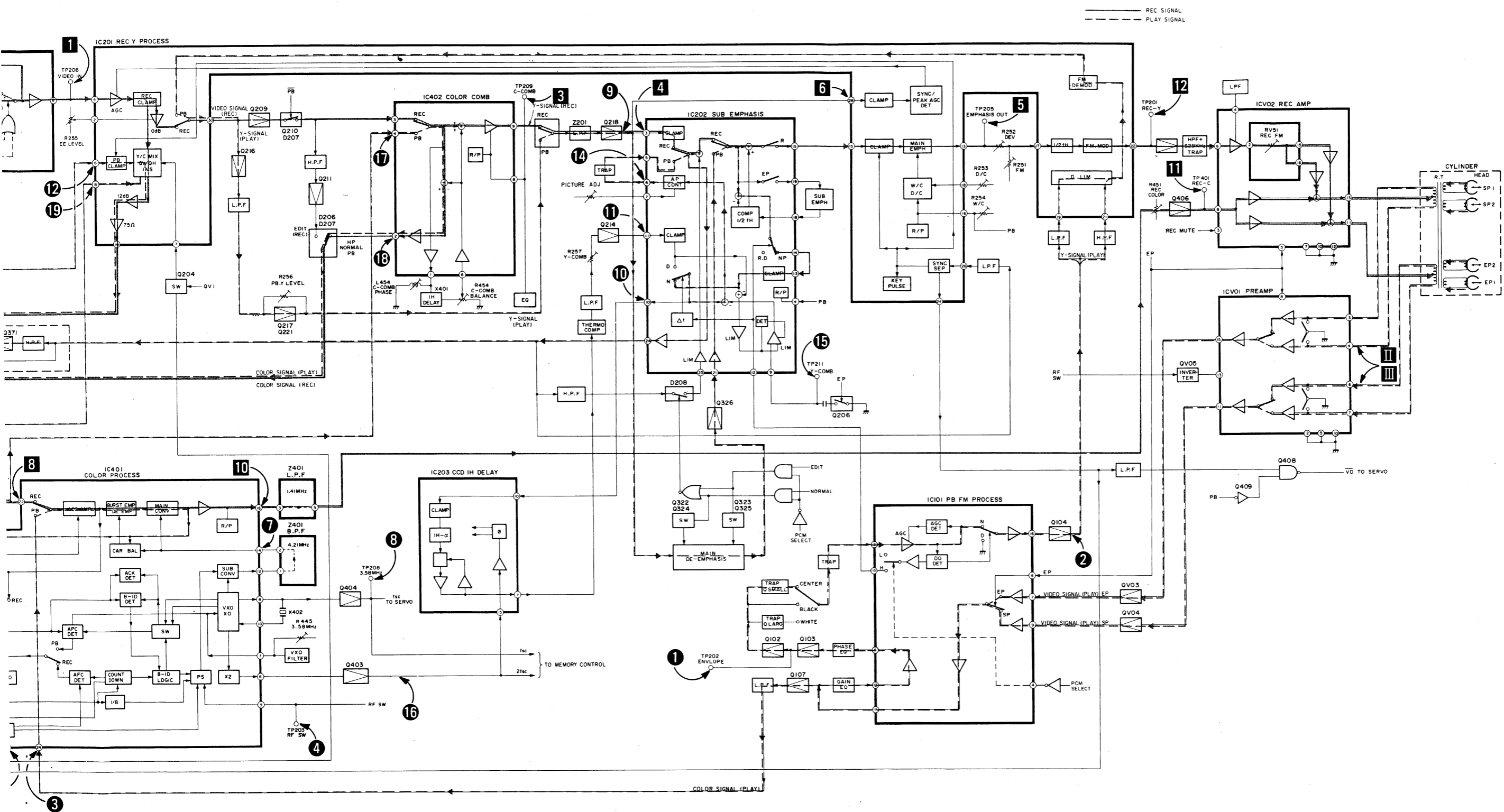
Record Mode

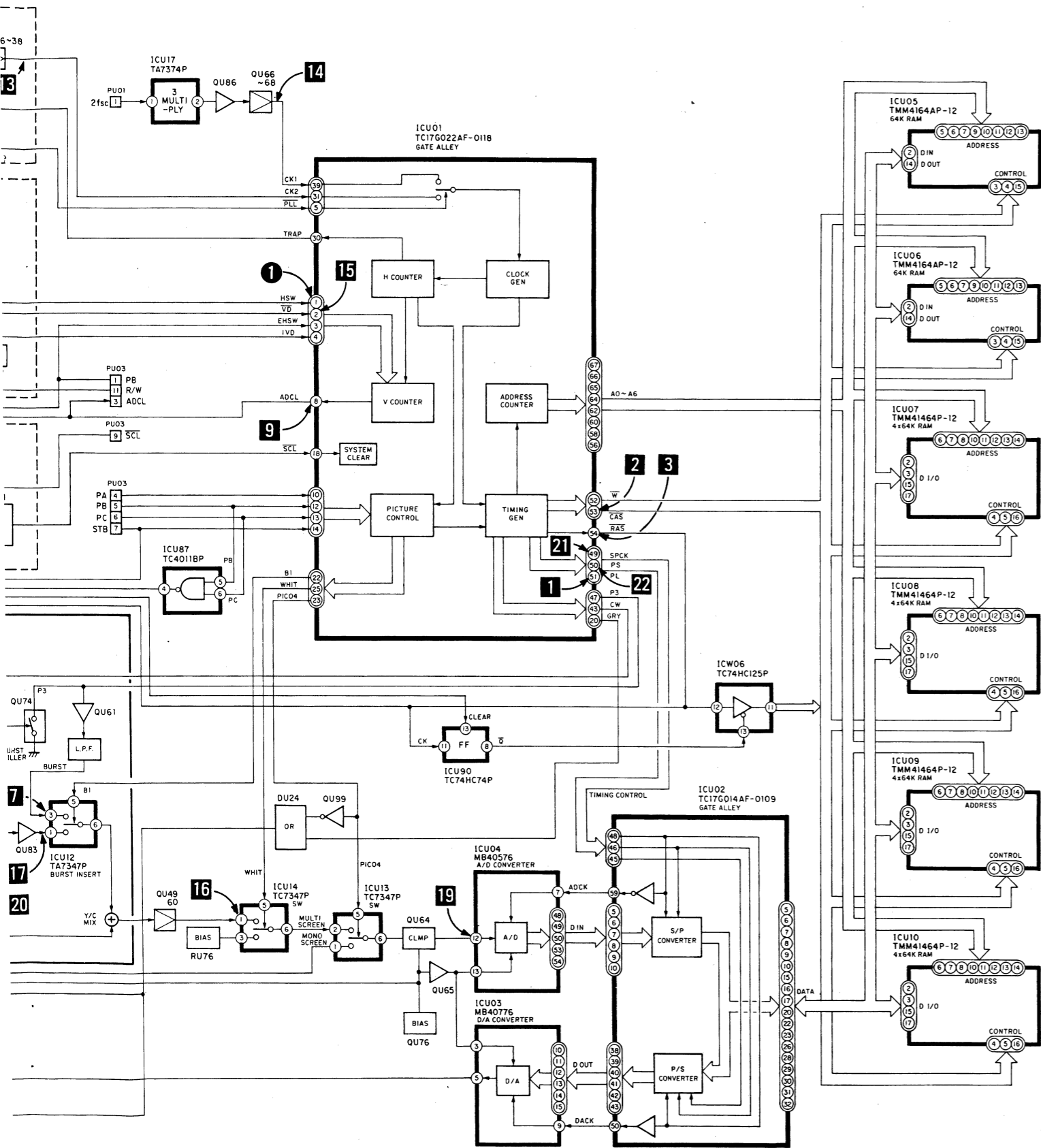
Playback Mode



13-1. Video Block Diagram

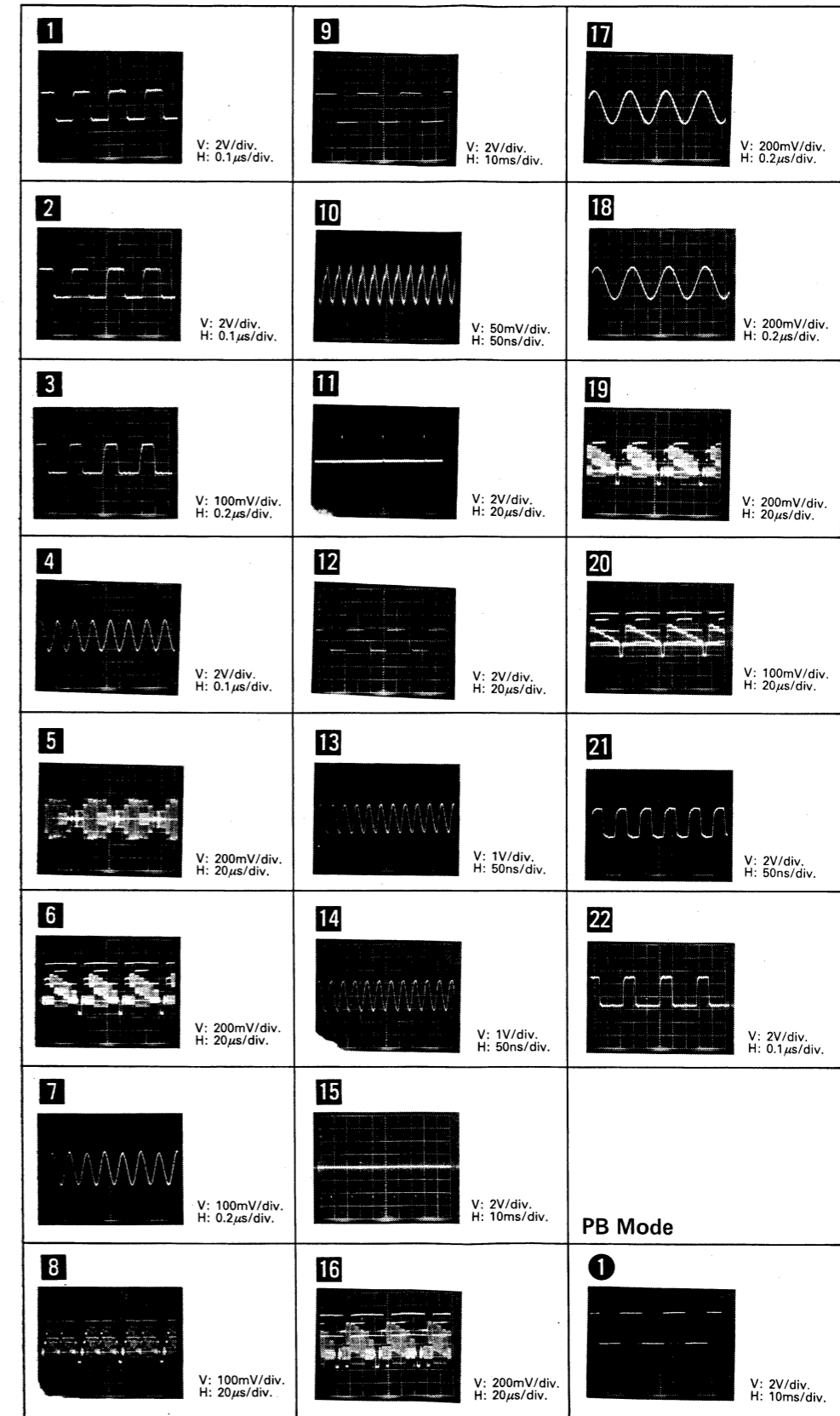






Memory Control Block Diagram (Waveforms)

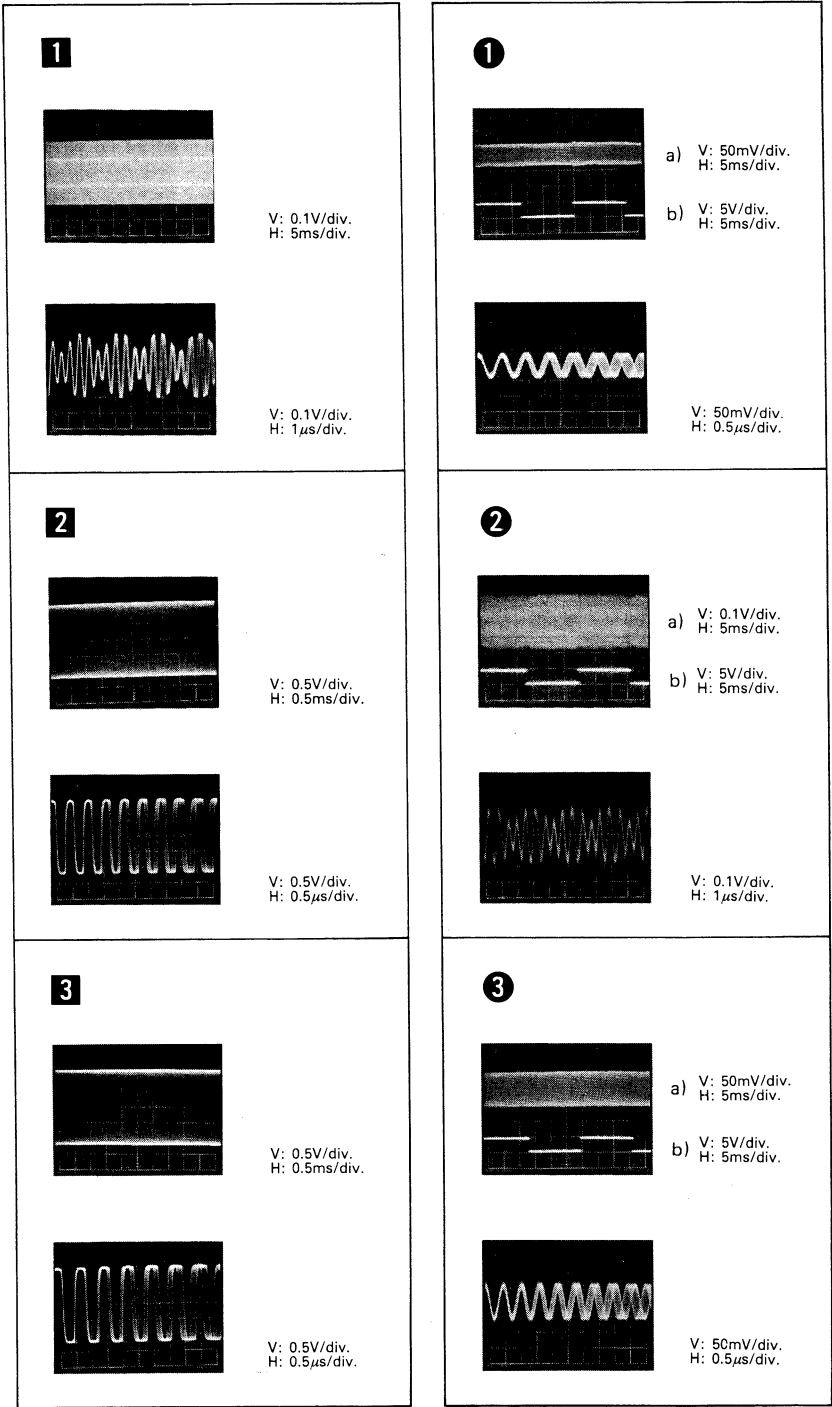
Multi Scan



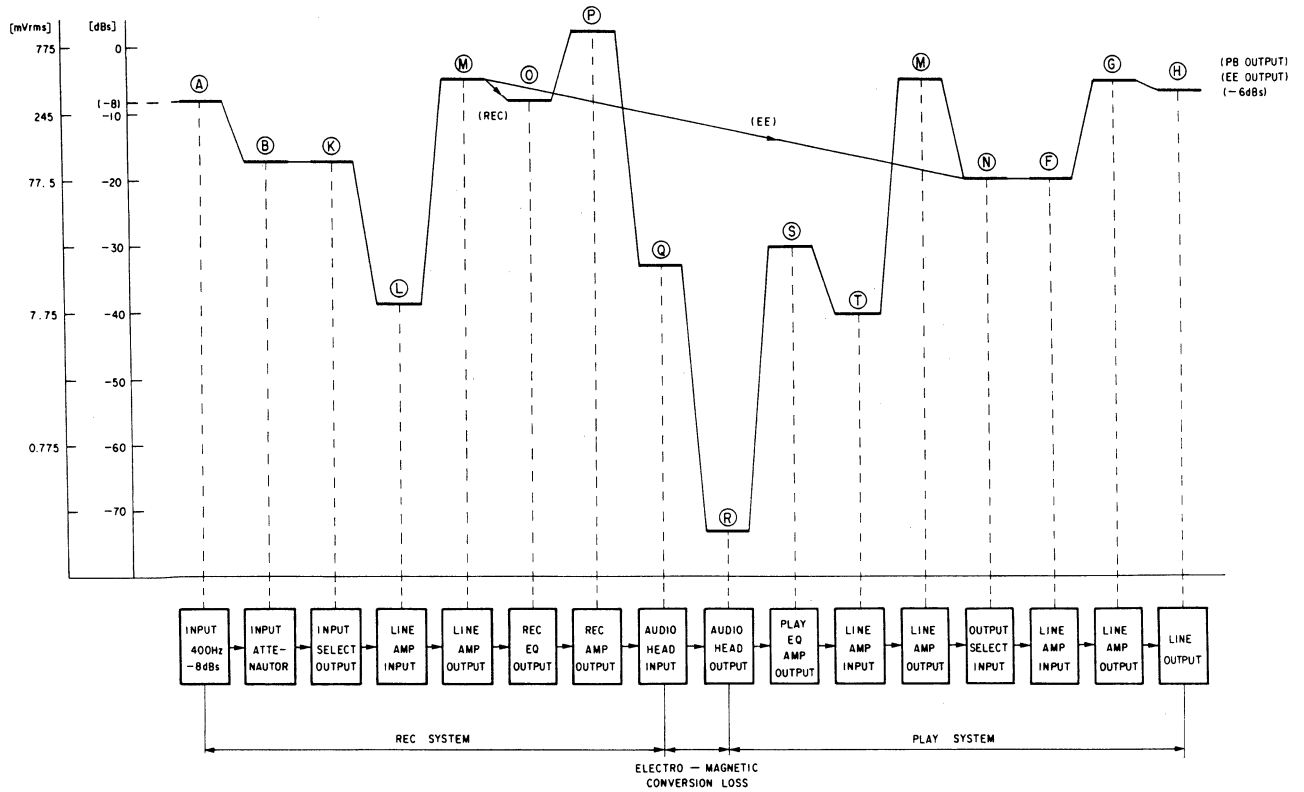
Audio Block Diagram (Waveforms)

Record Mode

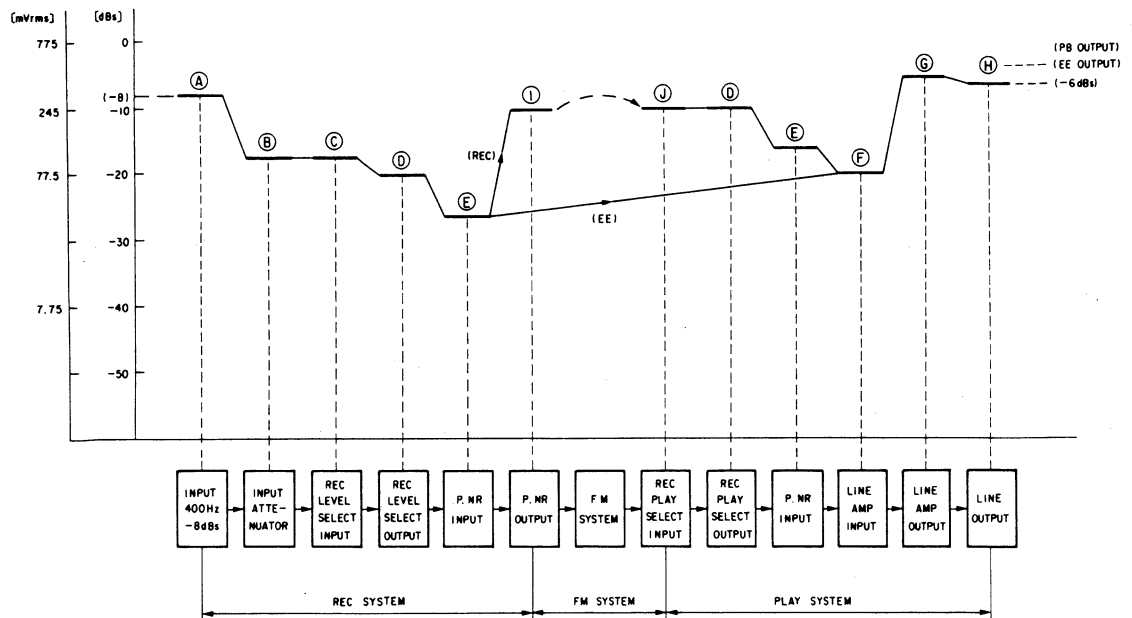
Playback Mode



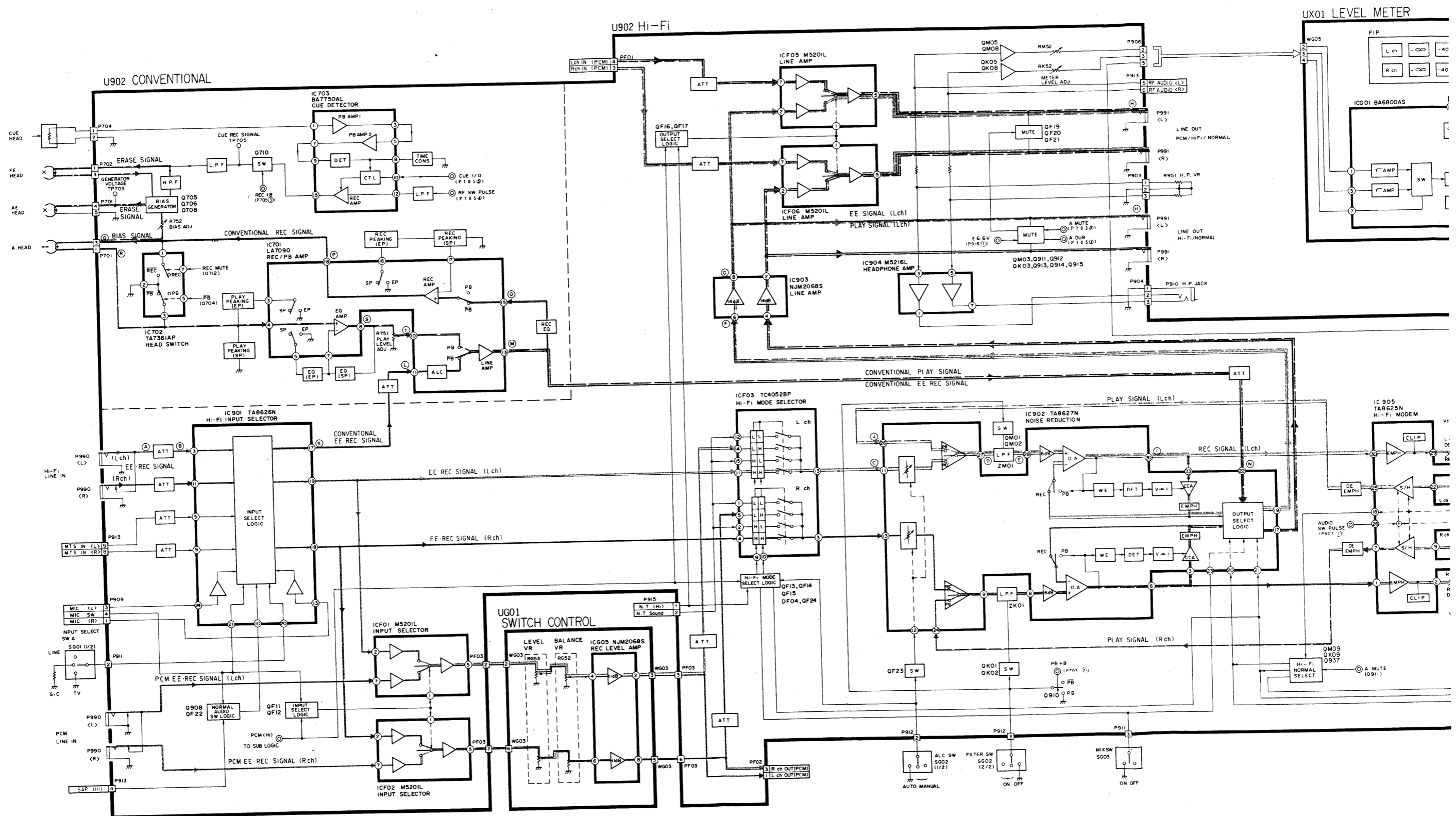
CONVENTIONAL LEVEL CHART



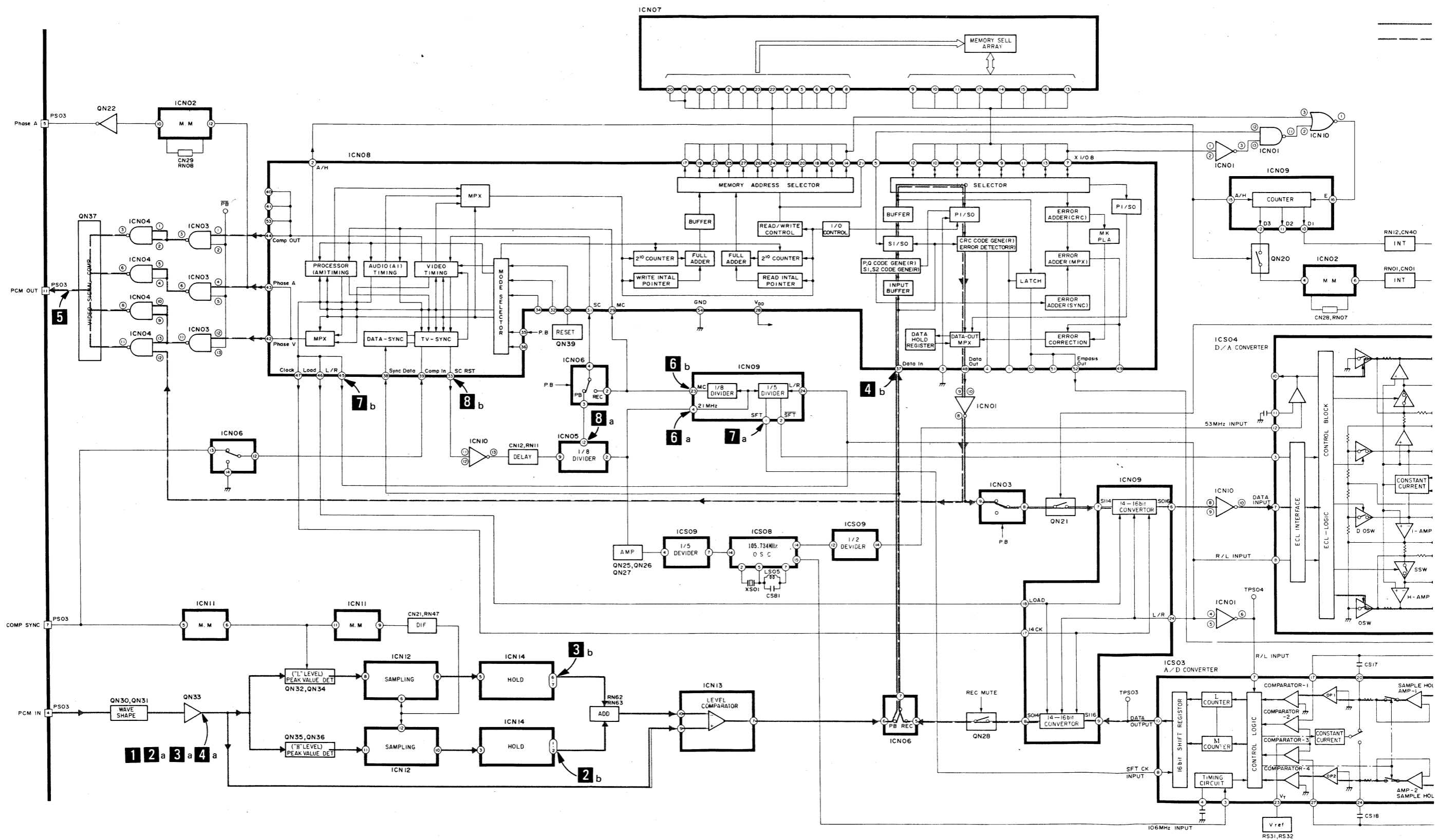
Hi-Fi LEVEL CHART

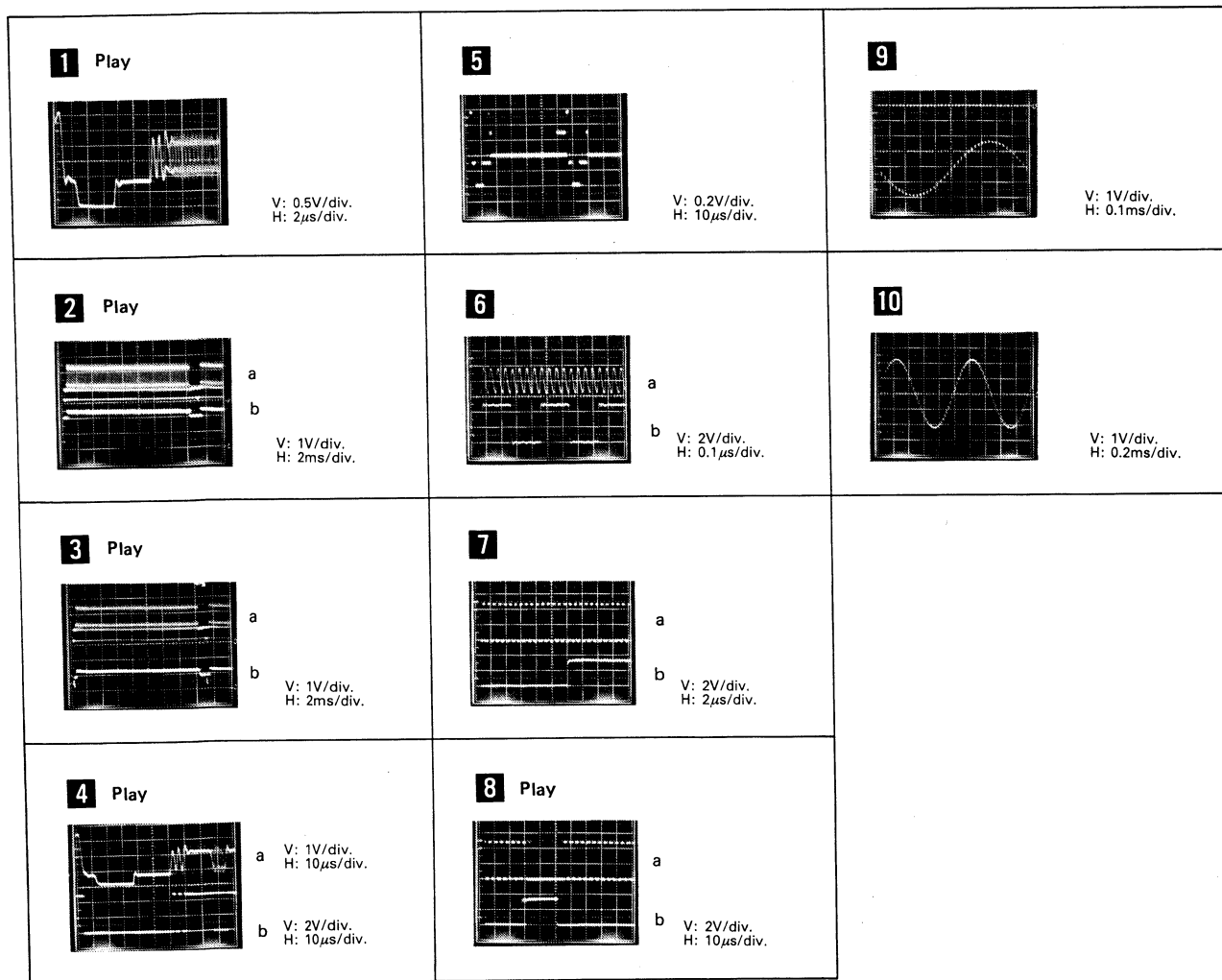


15-1. Audio Block Diagram



17-1. PCM Block Diagram





17-2. PCM Microcomputer Data

ICN08 TMS3475BNL

(1) Memory interface

Signal Name	Pin No.	Input/Output	Functions
A0 - A9	16 18 - 20 22 - 27	Output	A0 - A9 and AS constitute 11-bit memory address bus.
AS	14	Output	Lowest address bit Addressing of upper 7 bits data at "H". Addressing of lower 7 bits data at "L".
X WRITE	21	Output	Active "L". Memory write-in signal.
X I/O1 - X I/O7	8 - 13 15	I/O	7-bit memory data bus.
X I/O8	7	I/O	Error information bit added to word by word error decision of CRCC at PLAY mode. Error is displayed at "L".
X C/S	17	Output	Active "L" Memory select signal. Access of address control data at "H".

(2) Data monitor

Signal Name	Pin No.	Input/ Output	Functions
CONTROL DATA ERROR	1	Output	Active "H" Outputs control data latch pulse at PLAY mode when control data has no error. "L" at REC mode.
A/H	2	Output	Active "H" Framing signal output every six words of A/D and D/A 14-bit input/output data. Develops frequency of MC frequency/180.
X ADDRESS CONTROL IN	4	Input	Inputs address control data to serial at REC mode.
FETCH	5	Output	Active "H" Memory read-out data strobe signal.
PREVIOUS DATA HOLD INDICATION	49	Output	Active "H" When 3 words or more error exist for 1H in PLAY mode, correction is impossible and previous value is replaced. Thus indicating the process is performed.
Q-INHIBITS	50	Output	Outputs Q-inhibit signal of control signal at PLAY mode. ("L" is output when Q can be corrected.) Error is corrected only by P code at "L".
X DUBBING	51	Output	Outputs dubbing inhibit code of control signal at PLAY mode. Dubbing can be made at "L".
X EMPHASIS OUT	52	Output	Outputs preemphasis identification code of control signal at PLAY mode. Emphasis is used at "L".
C GATE	53	Output	Active "H" Outputs control data signal time and field output period "H".

(3) Sync/Clock

Signal Name	Pin No.	Input/ Output	Functions
MC	29	Input	Master clock input Inputs clock to control data process and input/output timing except timings on VCR.
SC	31	Input	Sub clock input Inputs clock to control timing on VCR and CRCC circuit.
SCRST	33	Output	Active "H" Outputs to initialize SC phase every 1H at PLAY mode. "L" at REC mode.
COMP IN	39	Input	Inputs composite sync signal at PLAY mode.
CRCC GATE PULSE	40	Output	Active "H" Outputs signal to display CRCC at PLAY mode.
ODD/X EVEN	41	Output	Outputs signal to display odd/even field of video signal. "L": Even field "H": Odd field
PHASE V (WHITE)	42	Output	Outputs WHITE signal at REC mode. Outputs MC, SC PLL control signal based on horizontal sync signal at PLAY mode.
PHASE A (PED OUT)	43	Output	Outputs PEDESTAL signal at REC mode. Outputs MC, SC PLL control signal generated by dividing MC at PLAY mode.
X COMP OUT	44	Output	Outputs composite sync signal at REC mode. "L" at PLAY mode.

(4) Data transmission, A/D, D/A control

Signal Name	Pin No.	Input/ Output	Functions
DATA IN	37	Input	Data input pin Inputs data from A/D at REC mode. Inputs data of video signal at PLAY mode.
SYNC DATA	38	Input	Inputs data sync signal at PLAY mode.
L/R	45	Output	Lch and Rch selection signal of A/D, D/A. REC mode: R at "H", L at "L". PLAY mode: L at "H", R at "L".
LOAD	46	Output	A/D conversion start signal at REC mode. D/A load signal at PLAY mode.
CLOCK	47	Output	A/D, D/A data transmission clock.
DATA OUT	48	Output	Outputs video signal data at REC mode. Outputs data for D/A at PLAY mode.
EMPHASIS IN	3	Input	Inputs preemphasis identification code of control signal at REC mode. Fixed "L" at PLAY mode.
X INT	30	Input	Active "L" Inputs memory address initialization.
X TEST	32	Input	Inputs test mode selection.
PAL/X NTSC	34	Input	Inputs PAL/NTSC selection. PAL at "H". NTSC at "L".
X REC/PB	35	Input	Inputs REC/PLAY mode selection. REC at "L". PLAY at "H".
TV/X ST	36	Input	Inputs TV/STATIONARY mode selection. STATIONARY mode at "L".
VDD	28	Input	+5V Power Supply
VSS	54	Input	GND
NC	6		NC

ICN09 TGA8502P

Terminal function

Pin No.	Name	Input/ Output	Functions
1	SFT	Output	Outputs 1/480 divided signal of pin 4 clock input Same phase for pin 24 input 16-bit CK.
2	$\overline{\text{SFT}}$	Output	Reverse to pin 1 output
3	GND		GND
4	CK21	Input	21 MHz CK input
5	GND		GND
6	S016	Output	Outputs 16-bit conversion signal of pin 7 serial 14-bit data input
7	S114	Input	Inputs serial 14-bit data
8	S014	Output	Outputs 14-bit conversion signal of pin 9 serial 16-bit data output
9	S116	Input	Input serial 16-bit data
10	D1	Output	Error detection ("H" when finding 1 word or more error in 6 words.)
11	D2	Output	Error detection ("H" when finding 2 words or more errors in 6 words.)
12	D3	Output	Error detection ("H" when finding 3 words or more errors in 6 words.)
13	DG1	Output	10/16 pulse width of pin 24 "L" period
14	DG2	Output	10/16 pulse width of pin 24 "H" period
15	A/H	Input	Inputs A/H signal for TMS3475BNL pin 2
16	E	Input	Inputs error signal
17	CK14 bit	Input	Inputs 14-bit clock
18	Load	Input	Inputs load signal for TMS3475BNL pin 46
19	VCC		Power supply
20	RST		
21			
22			
23	MC	Output	Outputs 1/8 divided signal of pin 4 21 MHz input
24	L/R	Input	Inputs L/R signal for TMS3475BNL pin 45

ICS03 TD6704P

Terminal function

Pin No.	Symbol	Functions	Note
1	VCCE	Plus power supply terminal for ECL logic section (5V)	
2	VEEA	Minus power supply terminal for analog section	
3 4 5	XN XO XP	OSC terminal Minus input Output Plus input	
6	VCCE	Plus power supply terminal for ECL logic section (5V: Same as that of pin 1)	
7	RL	Rch/Lch conversion operation select signal input terminal Lch input is sampled and held at rising edge and A/D converted for H level period.	
8	SFT	Shift clock input terminal to output converted digital data in serial	
9	GNDL	Ground terminal for TTL logic section (GND)	
10	DOUT	Digital data output terminal Data is synchronized with SFT falling to output from MSB.	
11	VDDL	Plus power supply terminal for TTL logic section (5V)	
12	GNDE	Ground terminal for ECL logic section	
13	NC	Open	
14	VEEA	Minus power supply terminal for analog section	
15	I ADJ	Current ratio adjustment terminal	
16	VEEA	Minus power supply terminal for analog section	
17	AOUTL	Lch integral amp output terminal Integral capacitor is connected across input terminal.	
18	SINL	Lch analog signal input terminal	
19	GNDA	Ground terminal for analog section	
20	AINL	Lch integral amp input terminal	
21	GNDS	Analog signal ground terminal	
22	I REF	Integral reference current input terminal (Ground potential) Double integration of $I_M = 4 \cdot I_{ref}$, $I_L = 1/32 \cdot I_{ref}$ is performed, where I_{ref} is a current flowing into IREF.	
23	VT	Comparator reference voltage input terminal When integrator output matches to VT, integral current is switched from I_M to I_L .	
24	AINR	Rch integral amp input terminal	
25	GNDA	Ground terminal for analog section	
26	SINR	Rch analog signal input terminal	
27	AOUTR	Rch integral amp output terminal Integral capacitor is connected across input terminal.	
28	VCCA	Plus power supply terminal for analog section	

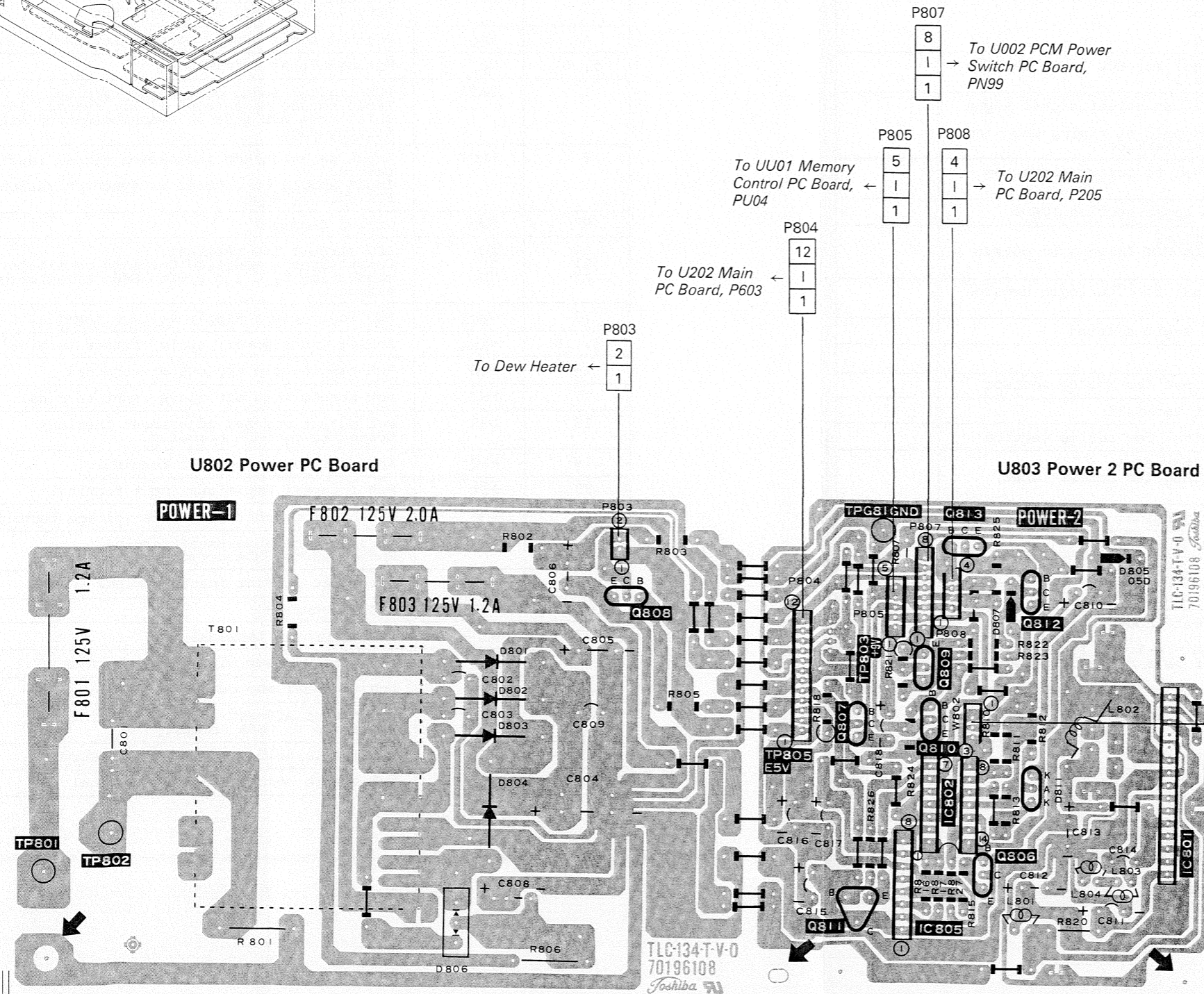
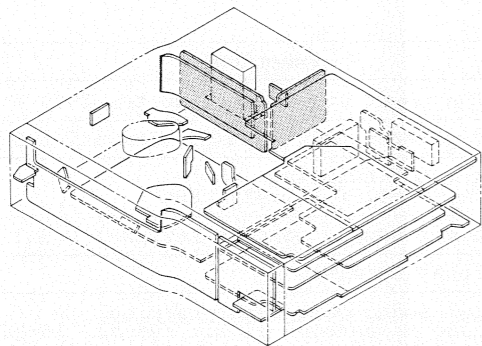
ICS04 TD6709N

Terminal function

Pin No.	Symbol	Functions	Note
1	VCCA	Analog plus power supply voltage terminal (+5V)	
2	VCCE	ECL logic power supply voltage terminal (+5V)	
3	BCK	Bit clock input terminal Duty cycle = 50%, $f = 1.4112$ MHz	
4	VCCD	Digital power supply voltage terminal (+5V)	
5, 6	NC	Not connected terminal	
7	DATA	PCM digital audio data input terminal Input should be entered in bit serial (16-bit unit) from MSB side in synchronization with BCK falling edge.	
8	LRCK	Input data Lch/Rch indication signal input terminal Input should be entered in synchronization with BCK falling edge.	
9	GND	Ground terminal	
10 11 12	XO XP XN	OSC circuit I/O terminal Constitutes a modified Colpitts oscillator by connecting L, C and R with SAW resonator or X'tal element.	
13	VCCE	ECL logic power supply voltage terminal (+5V)	
14, 15	VEEA	Analog minus power supply voltage terminal (-5V)	
16	RSO	Rch sample hold amp output terminal	
17	RSI	Rch sample hold amp minus input terminal	
18	OSR	Rch output off-set adjustment terminal Connected to GNDA normally.	
19	R10	Rch integral amp output terminal	
20	R11	Rch integral amp minus input terminal	
21	VDC	Discharge circuit reference voltage terminal	
22	I ADJ	Current fine adjustment terminal Connected to GNDA normally.	
23	I REF	Reference current input terminal	
24	GNDS	Ground terminal	
25	GNDA	Analog ground terminal	
26	LII	Lch integral amp minus input terminal	
27	LIO	Lch integral amp output terminal	
28	OSL	Lch output off-set adjustment terminal Connected to GNDA normally.	
29	LSI	Lch sample hold amp minus input terminal	
30	LSO	Lch sample hold amp output terminal	

1 2 3 4 5 6 7 8 9 10 11

7-2. Power Supply PC Board



Voltage Location of Transistor (V): PCM SW OFF

Symbol No.	POWER OFF			EE			PLAY			PCM REC			Location
	E	C	B	E	C	B	E	C	B	E	C	B	
Q803	0.0	19.1	0.5	9.1	17.2	9.7	9.1	16.9	9.7	9.1	16.7	9.7	E-9
Q804	0.0	19.1	0.5	9.1	17.2	9.7	9.1	16.9	9.7	9.1	16.7	9.7	E-9
Q806	5.8	6.7	6.4	5.7	6.7	6.3	5.7	6.6	6.2	5.7	6.6	6.3	G-7
Q807	0	0.0	5.6	0	5.1	0.2	0	5.0	0.2	0	5.0	0.2	F-6
Q808	0	0.8	1.3	0	0.8	1.3	0	16.9	0.1	0	16.8	0.1	E-4
Q809	0.0	0.0	0.0	9.1	9.1	8.3	9.1	9.1	8.3	9.1	0.1	9.1	F-6
Q810	0.4	0.0	0.4	5.0	5.0	4.3	5.0	5.0	4.3	5.0	0.1	5.0	F-6
Q811	0.0	6.7	0.0	5.1	6.7	5.6	5.0	6.6	5.6	5.0	6.6	5.5	G-6
Q812	0	0.0	0.4	0	0.1	0.8	0	0.1	0.8	0	9.1	0.0	E-7
Q813	0	0.4	0.0	0	0.8	0.0	0	0.8	0.0	0	0.0	7.7	E-6

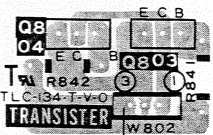
Location of Diodes

Symbol No.	Location
D801	E-4
D802	F-4
D803	F-4
D804	F-4
D805	E-7
D807	E-7
D811	F-7

Location of IC's

Symbol No.	Location
IC801	G-8
IC802	F-6
IC805	G-6

U804 Power Transistor PC Board



1

2

3

4

5

POWER
SUPPLYPOWER
SUPPLY

6

7

8

9

10

7-3. Power Supply Circuit

A

B

C

D

E

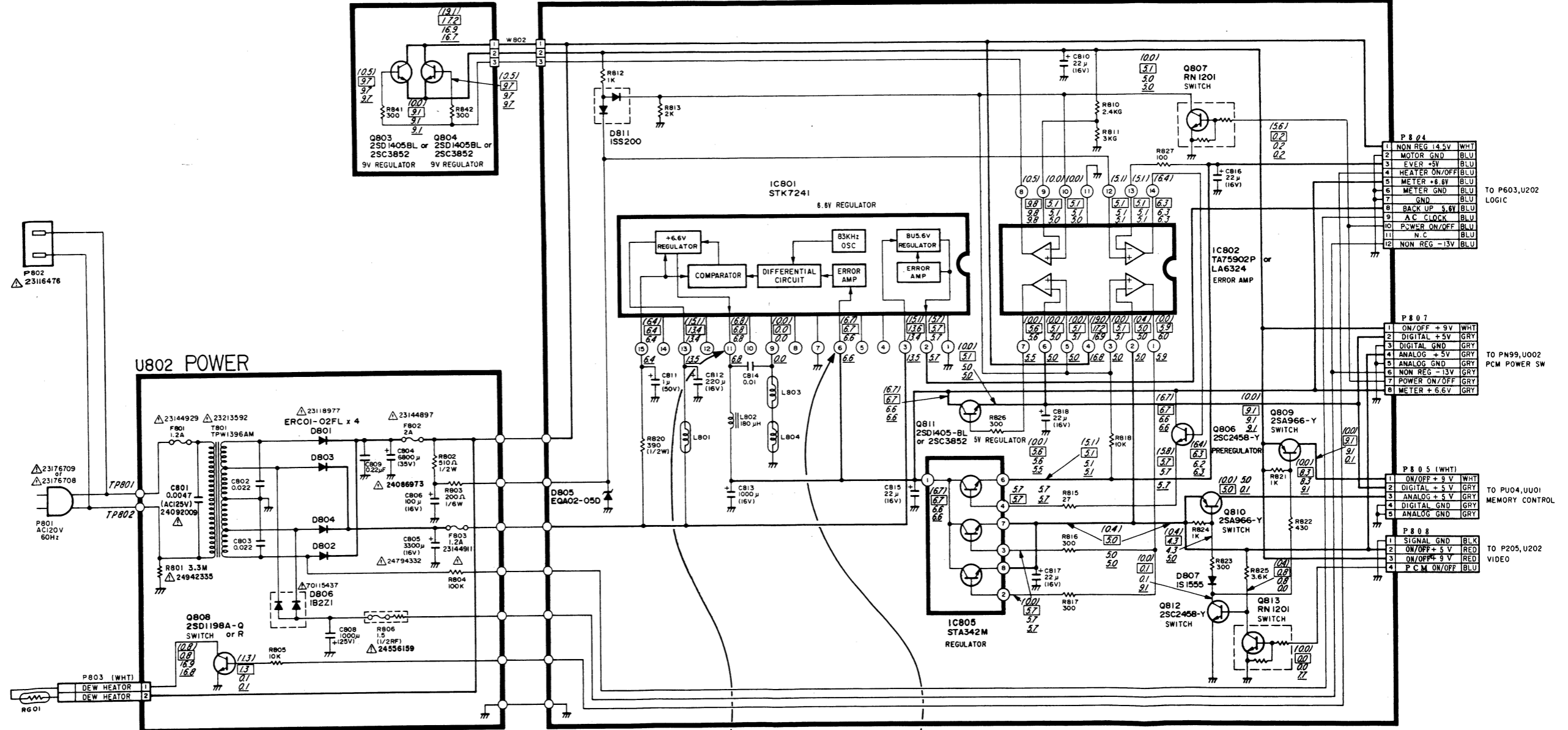
F

G

U804
POWER
TRANSISTOR

U803 POWER 2

1V : POWER OFF MODE
 V : EE MODE
 V : PLAY MODE
 V : REC MODE (PCM SW ON)



V: 5V/div.
 H: 5μs/div.

V: 10mV/div.
 H: 5μs/div.

1

2

3

4

5

6

7

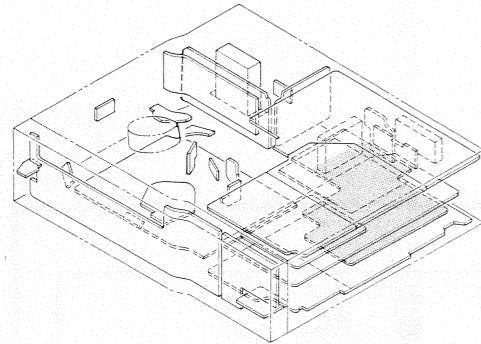
8

9

10

11

8-2. TV Receiving PC Board (Tuner, PIF, MTS)



Voltage and Location of Transistors

Symbol No.	E	C	B	Location
Q002	0.7	6.1	1.4	D-2
Q003	0.6	4.8	1.3	E-9
Q004	2.0	0	1.3	C-7
Q005	2.9	6.5	3.5	E-9
Q006	7.9	0.1	7.5	B-11
Q007	8.8	8.7	10.0	C-11
Q008	8.8	0	8.7	C-11
Q009	4.9	0.6	4.2	C-11
Q010	0	0	0.6	C-11
Q011	9.0	8.8	8.3	E-7
Q012	0	0	3.0	E-8
Q013	0	3.0	0	E-8
Q014	5.4	8.8	6.1	C-9
Q015	2.1	6.8	2.8	D-7
Q017	1.3	7.3	2.0	C-7
Q018	5.4	5.3	4.7	E-7
QA02	1.5	5.3	2.0	D-11
QA03	0.8	5.3	1.5	E-11
QA04	0	—	0.6	D-10
QD01	0	4.1	0.7	F-7
QD62	5.3	0	5.3	D-6
QD71	5.3	0	5.3	D-6
QD72	0	5.3	0	D-6
QD73	2.6	6.0	3.3	C-6
QD99	0	9.0	0	D-7
QD64	0	0	0	—

QA04 collector voltage varies from 1.1 to 26.5(V) depending on receiving ch.

Voltage and Location of Transistors

Receiving mode	VL			VH			VS			U			Location
Transistor	E	C	B	E	C	B	E	C	B	E	C	B	
QA05	0	0	5.0	0	0	5.0	0	0	5.0	0	8.8	0	B-9
QA06	8.5	0	8.8	8.5	0	8.8	8.5	0	8.8	8.8	8.7	0	C-10
QA07	8.8	8.7	8.0	8.8	8.7	8.0	8.8	8.7	8.0	8.8	0	8.8	B-10
QA08	0	25	0	0	0	5.5	0	0	5.5	0	25	0	D-10
QA09	0	25	0	0	25	0	0	0	3.2	0	25	0	C-10

VL: 2 to 6, A8 to A3
 VH: 7 to 13, A2, A1, A to I
 VS: J to W, AA to ZZ, AAA to CCC
 U: 14 to 83

Location of IC's

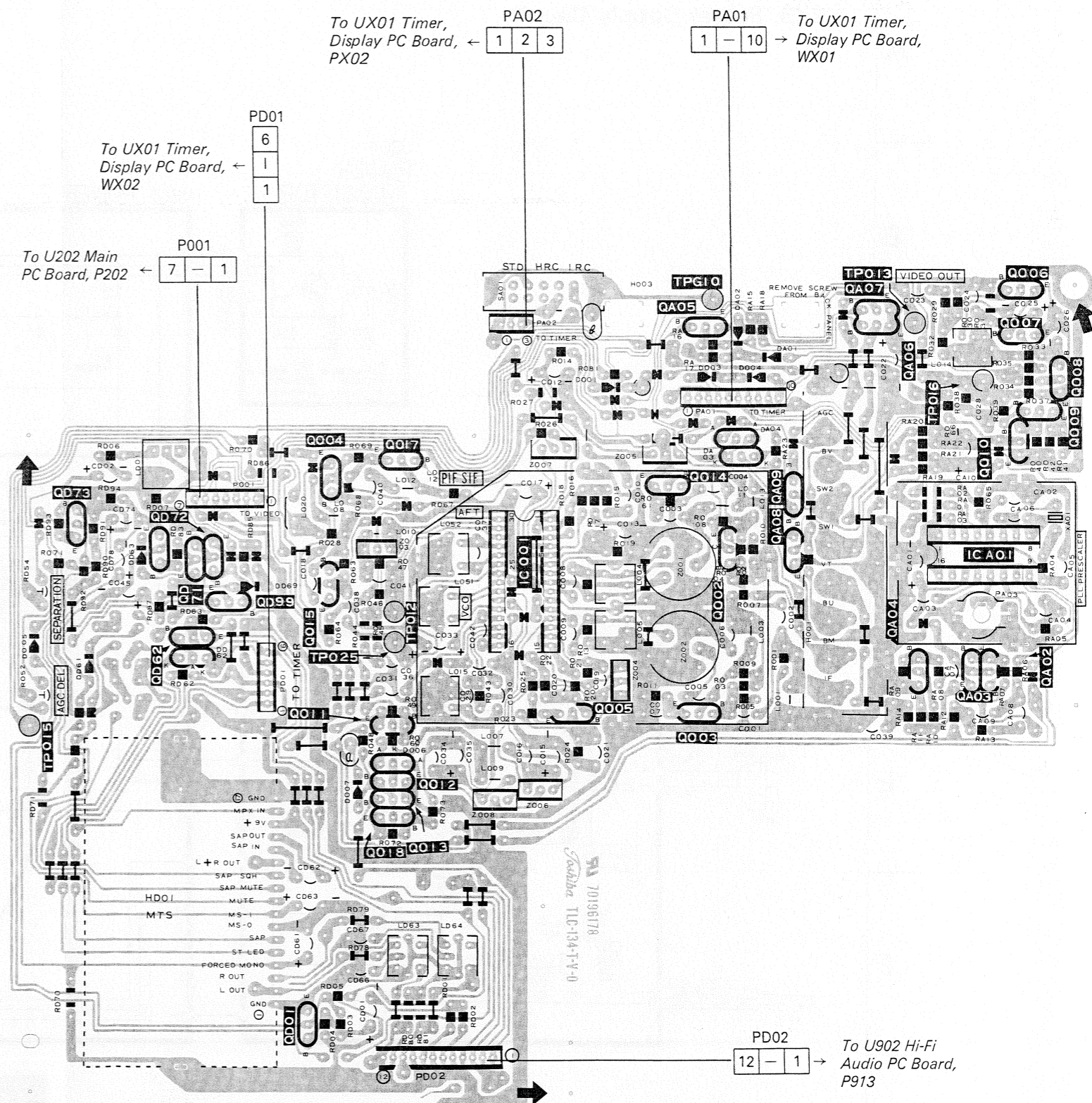
Symbol No.	Location
ICA01	D-11
IC001	D-8

Location of adjusting VR's

Symbol No.	Location
RD52	D-5
RD54	D-5

Location of Diodes

Symbol No.	Location
D001	C-8
D003	C-9
D004	C-9
D005	D-5
D007	E-7
DD61	D-6
DD63	D-6
DD69	D-7
DA01	C-10
DA02	B-9



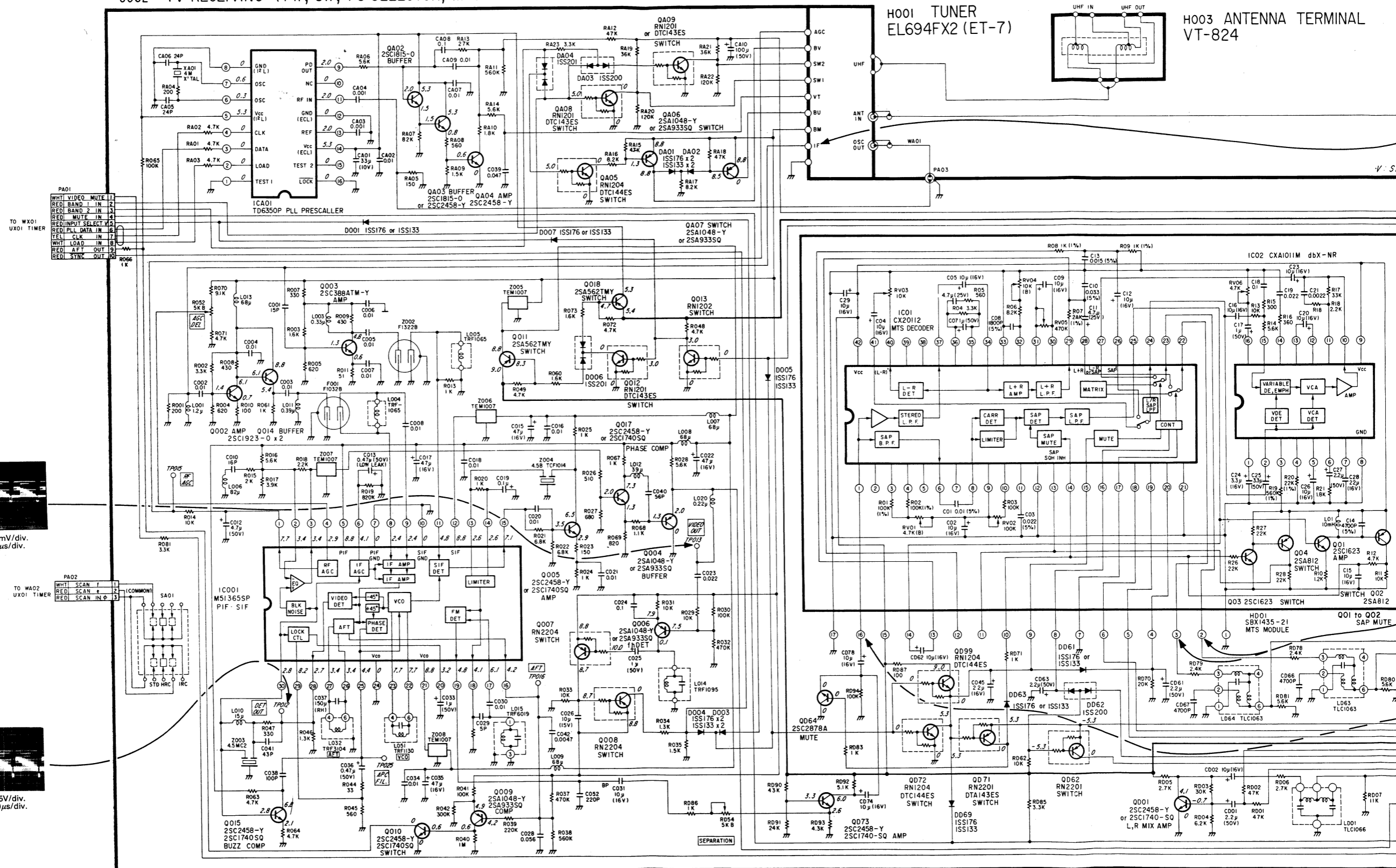
U002 TV Receiving PC Board (PIF, MTS)

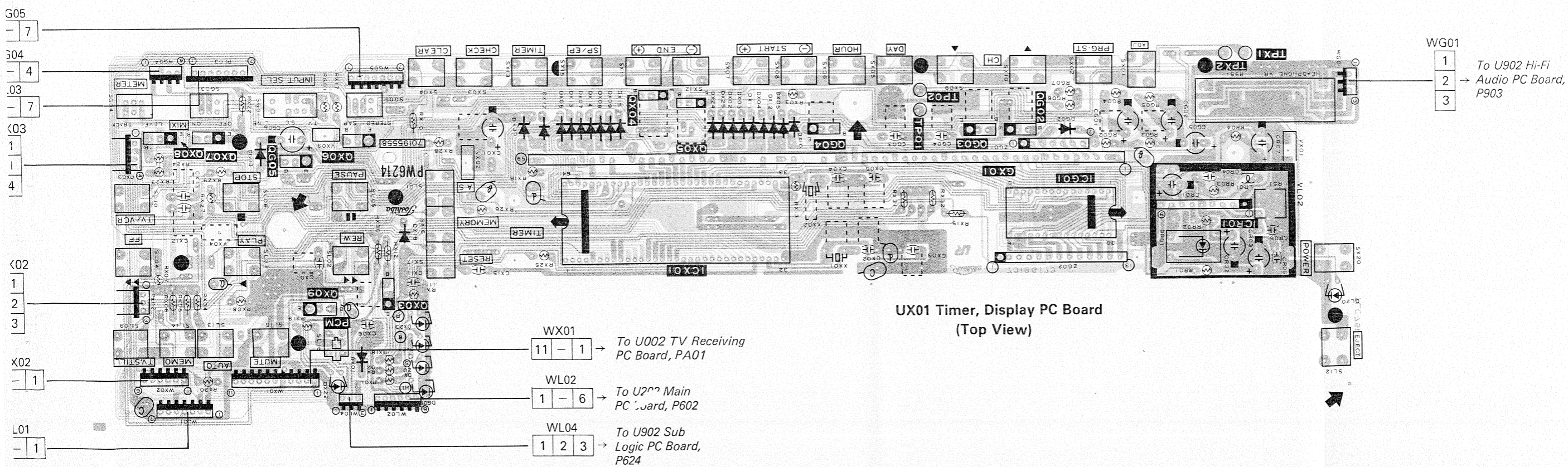
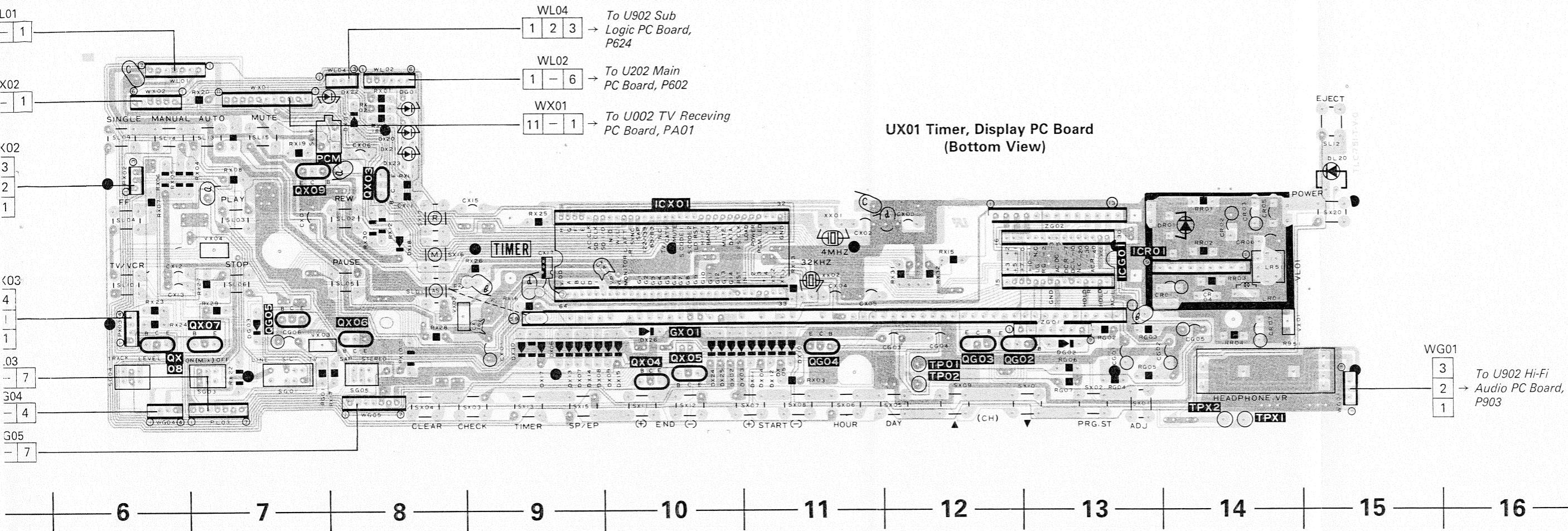
8-3. TV Receiving Circuit (Tuner, PIF, MTS)

U002 TV RECEIVING (PIF, SIF, FS SELECTOR, MTS DECODER)

H001 TUNER
EL694FX2 (ET-7)

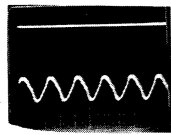
H003 ANTENNA TERMINAL
VT-824



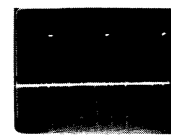


9-3. Timer, Display Circuit

UX01 TIMER, DISPLAY



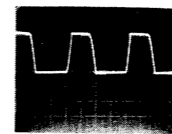
V: 5V/div.
H: 2μs/div.



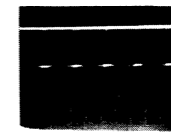
V: 10V/div.
H: 2ms/div.



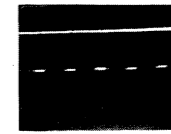
V: 10V/div.
H: 2ms/div.



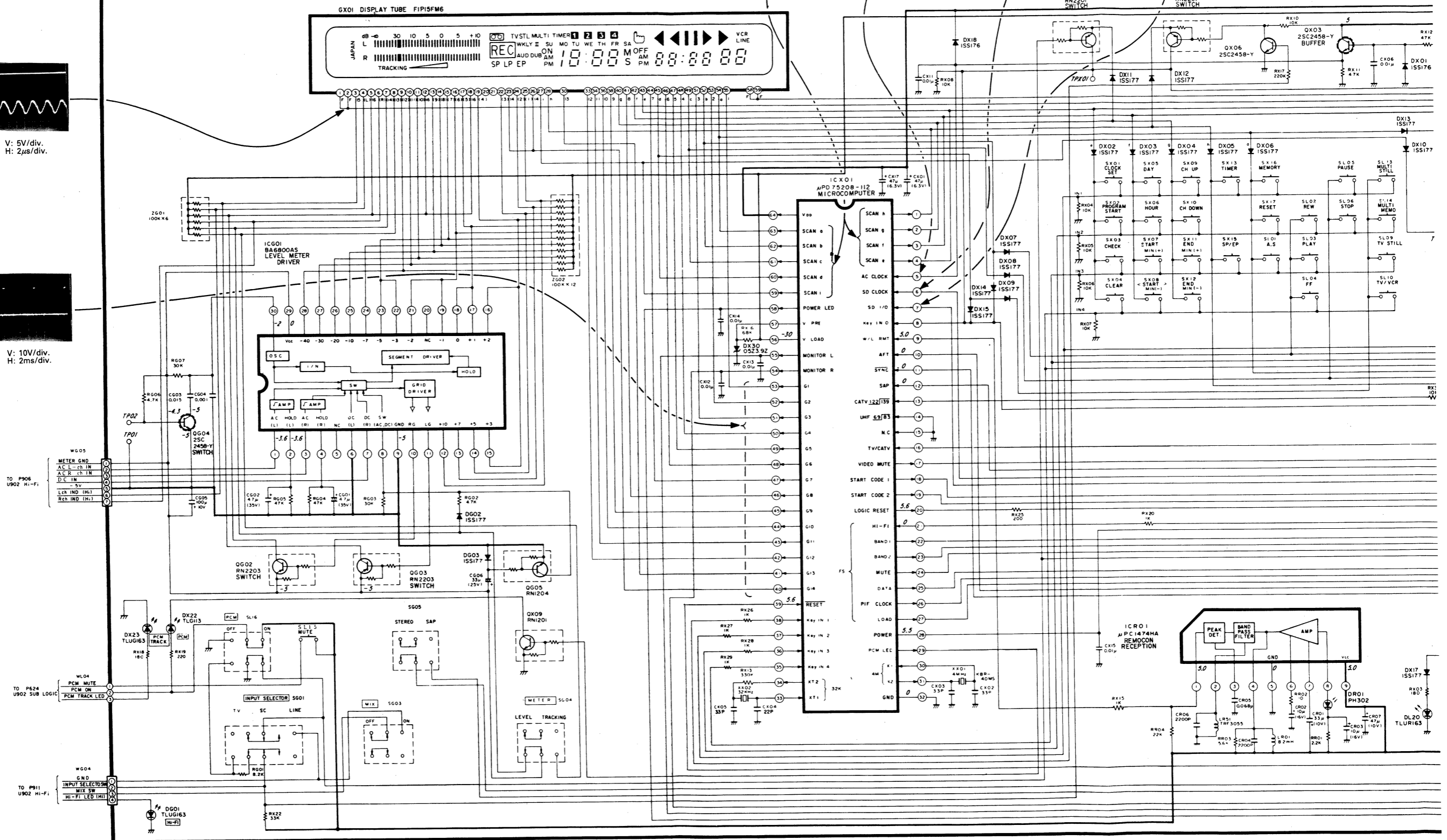
V: 2V/div.
H: 5ms/div.



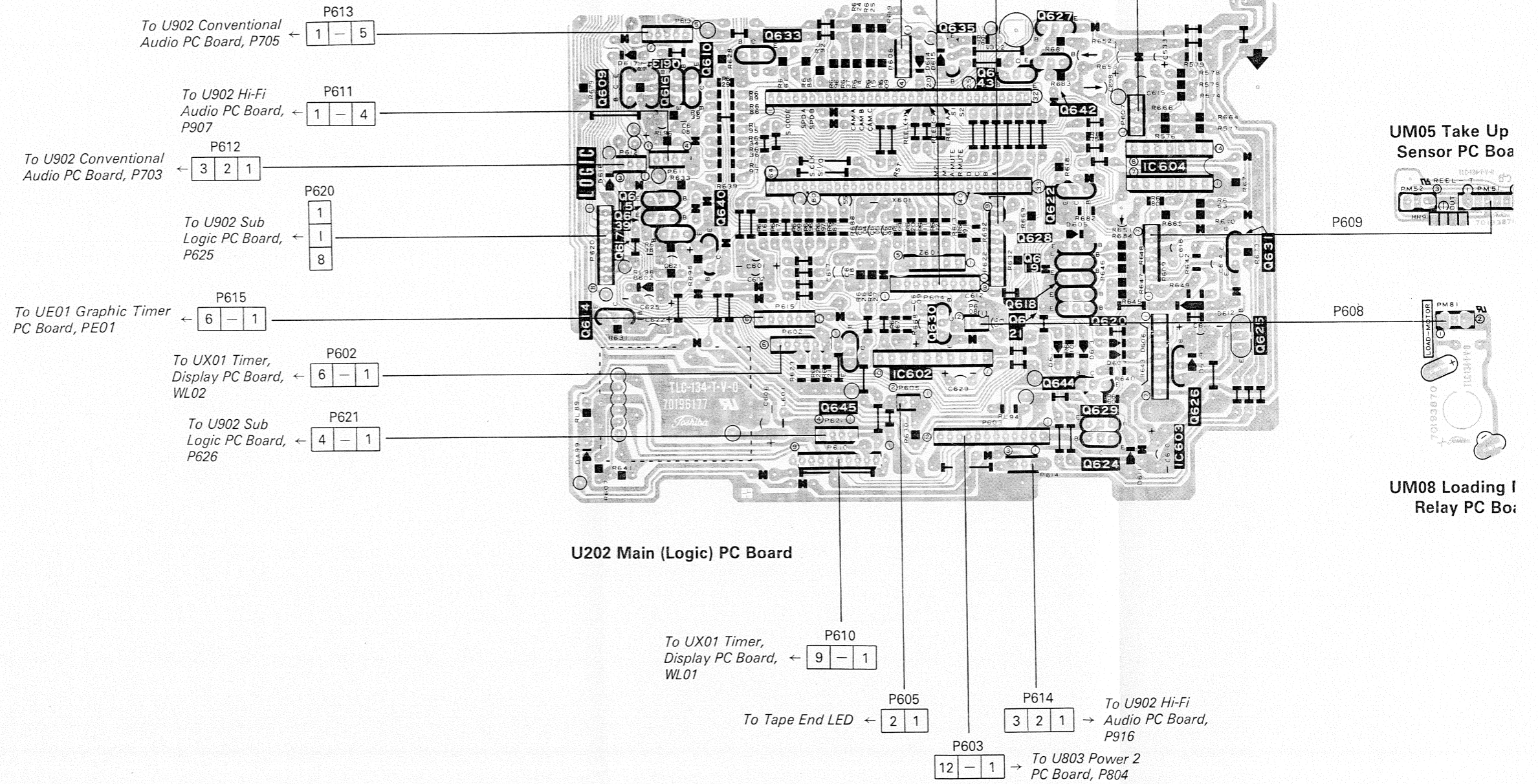
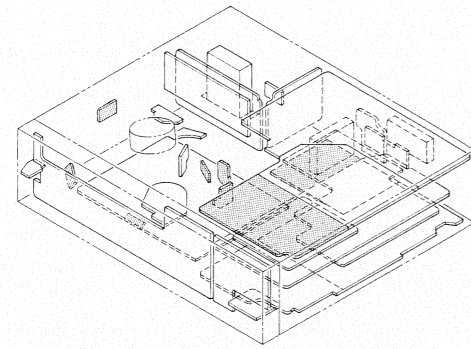
V: 2V/div.
H: 0.5ms/div.



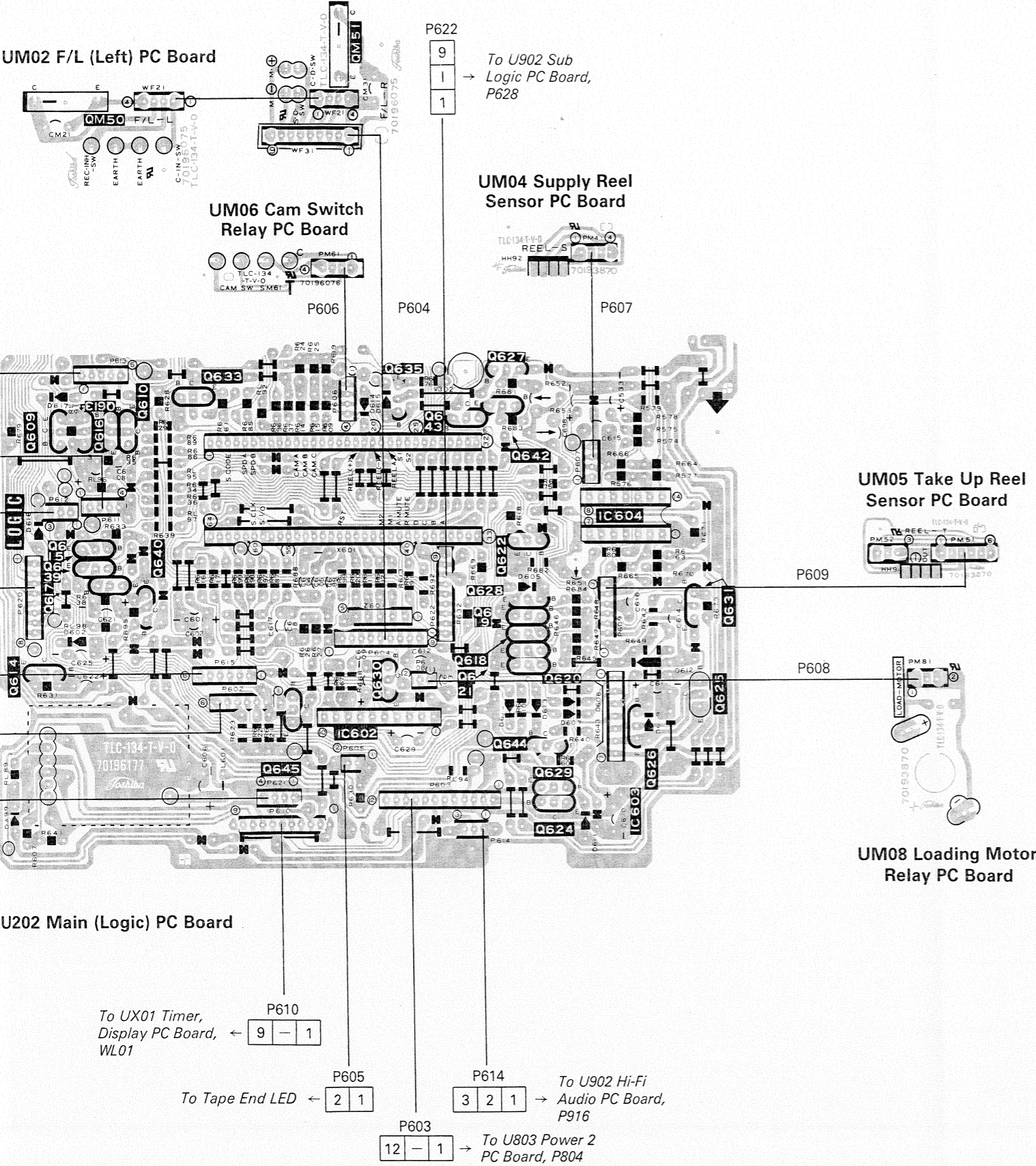
V: 2V/div.
H: 0.5ms/div.



10-2. Logic PC Board



UM03 F/L (Right) PC Board



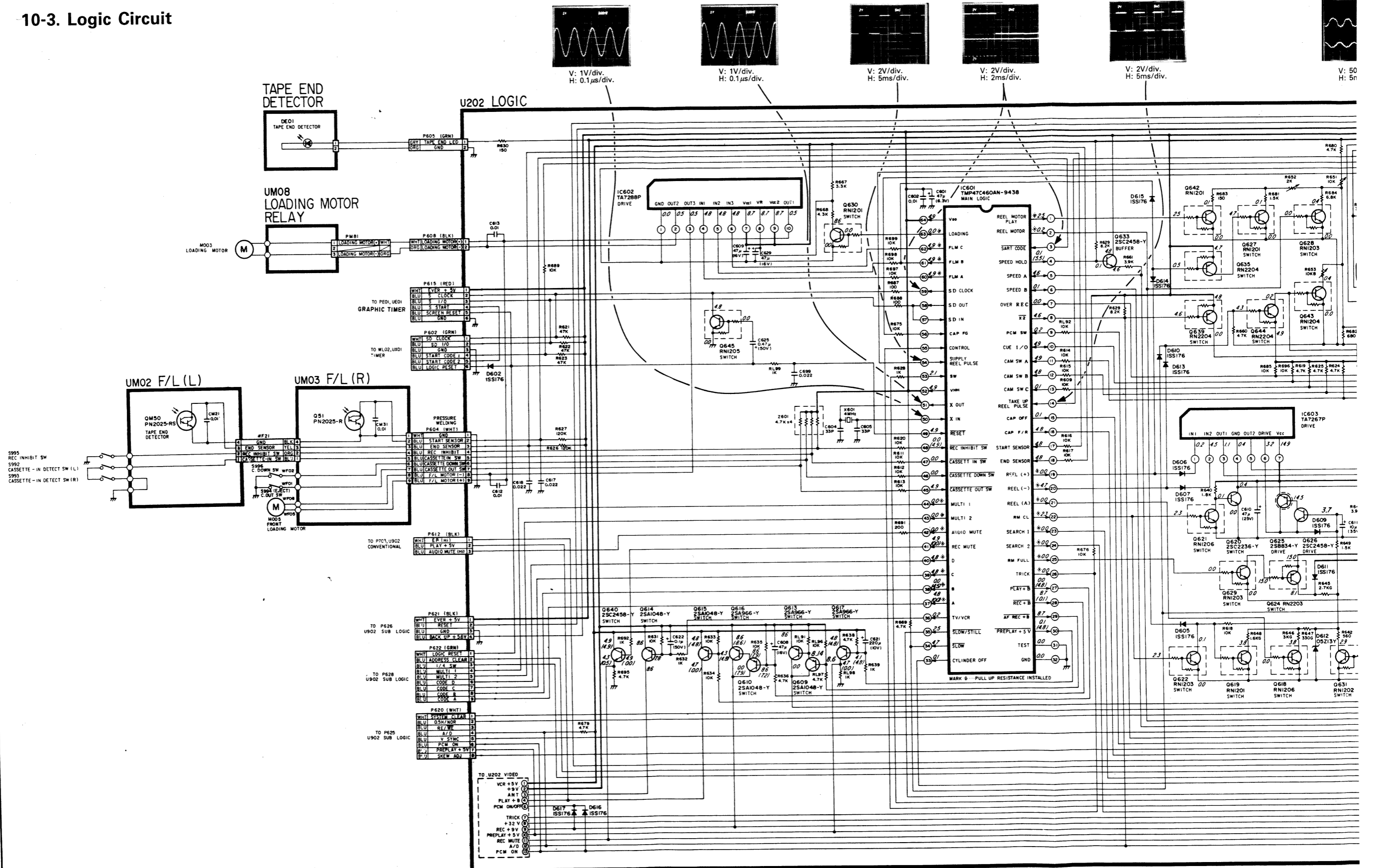
Symbol No.	Voltage8(Unit:V)			Location
	E	C	B	
Q609	8.14	0.0	8.6	C-6
Q610	8.6(7.9)	0.0(7.9)	8.6(7.2)	C-7
Q613	8.6	0.0	8.14	C-7
Q614	8.6	8.6	7.8	E-6
Q615	4.8(4.8)	4.7(0.0)	4.3(4.8)	D-6
Q616	8.6(8.6)	0.0(7.9)	8.6(7.9)	C-7
Q617	4.8(4.8)	4.7(0.0)	4.1(4.8)	D-6
Q618	0.0	3.8	0.0	E-9
Q619	0.0	3.8	0.1	D-9
Q620	0.0	0.4	0.1	E-9
Q621	0.0	0.1	2.3	E-9
Q622	0.0	0.1	2.3	D-9
Q624	15.0	8.1	15.0	F-9
Q625	14.9	3.2	14.5	E-10
Q626	3.2	14.5	3.7	E-10
Q627	0.0	0.1	4.7	C-9
Q628	0.0	0.4	0.0	D-9
Q629	0.0	15.0	0.0	E-9
Q630	0.0	8.6	0.0	E-8
Q631	0.0	2.9	1.7	D-10
Q633	4.6	4.8	0.1	C-7
Q635	4.7	4.7	0.5	C-8
Q639	4.8	0.0	4.6	D-6
Q640	4.3(0.5)	4.9(4.9)	4.9(0.0)	D-7
Q642	0.0	0.1	2.5	C-9
Q643	0.0	0.4	0.2	C-9
Q644	4.9	0.2	4.3	E-9
Q645	0.0	4.8	0.0	E-8
Q650	-	-	-	B-7
Q651	-	-	-	A-8

Symbol No.	Location
D602	D-6
D605	D-9
D606	E-10
D607	E-9
D609	E-10
D610	E-9
D611	F-10
D612	E-10
D613	E-10
D614	E-9
D615	C-8
D616	C-8
D617	C-6
DA99	F-6

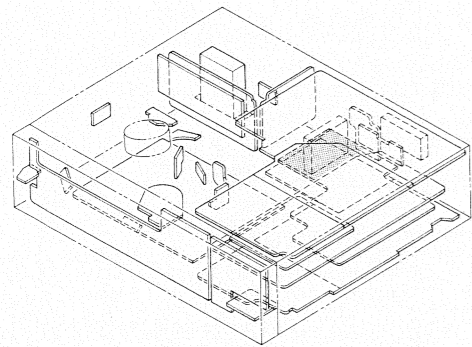
Symbol No.	Location
IC601	D-8
IC602	E-8
IC603	E-10
IC604	D-10

Symbol No.	Location
R651	D-9
R652	C-9
R653	C-9

10-3. Logic Circuit



G



Voltage and Location of Transistors

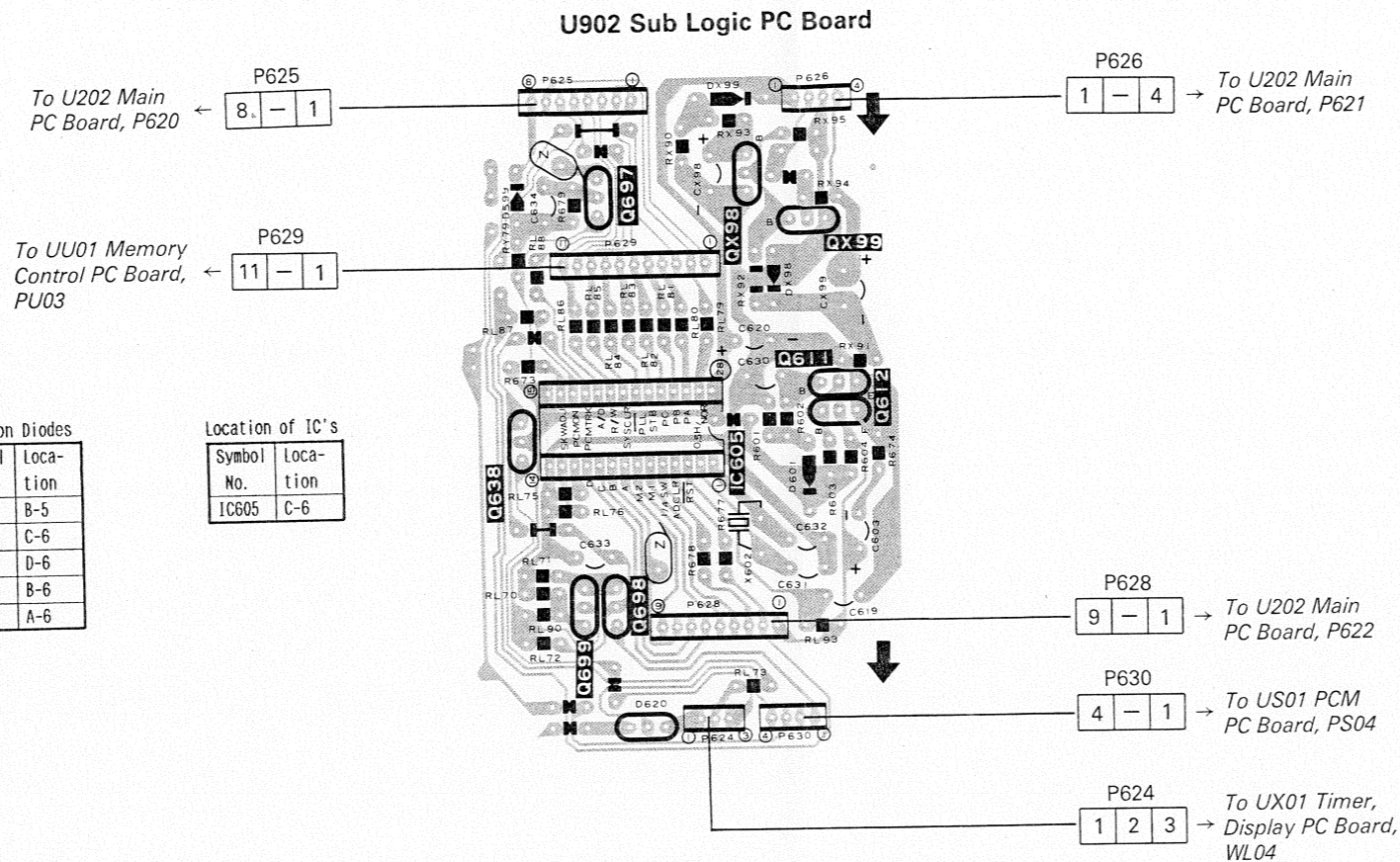
Symbol No.	Voltage(Unit:V)			Loca- tion
	E	C	B	
Q611	0.0	0.1	0.7	C-6
Q612	0.0	4.9	0.1	C-7
Q638	0.1	4.9	0.0	C-5
Q697	—	—	—	B-6
Q698	0.4	0.0	0.2	D-6
Q699	0.4	4.9	1.0	D-5
QX98	0.0	0.0	0.7	B-6
QX99	0.0	5.6	0.0	B-7

Location Diodes

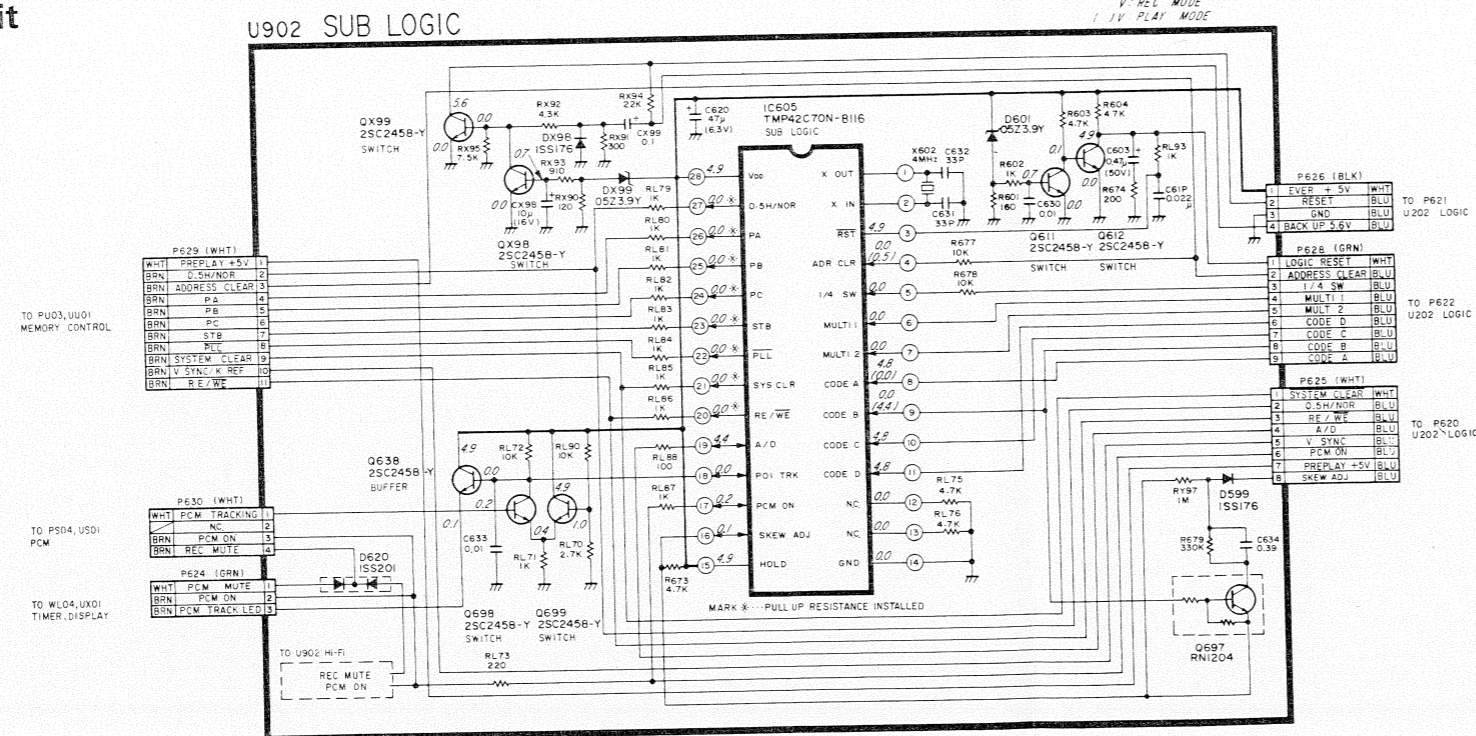
Symbol No.	Location
D599	B-5
D601	C-6
D620	D-6
DX98	B-6
DX99	A-6

Location of IC's

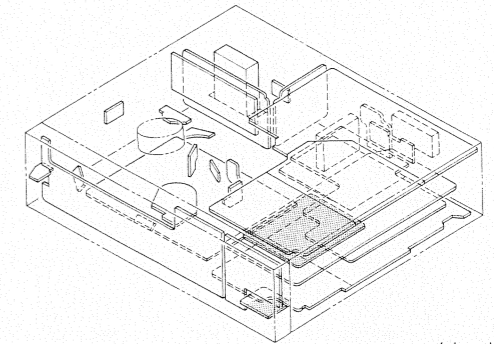
Symbol No.	Loca- tion
IC605	C-6



10-5. Sub Logic Circuit



11-2. Graphic Timer PC Board



Voltage and Location of

Location Diodes

Symbol No.	Location
DE02	D-14
DE03	D-14
DE04	C-14
DE05	D-14
DE06	D-14
DE07	D-14

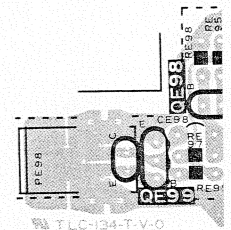
Location of adjusting VR's

Symbol No.	Loca- tion
RE51	B-16

Location IC's

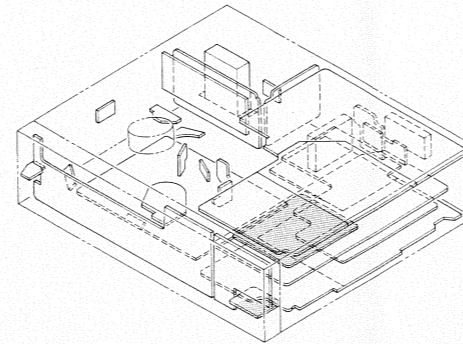
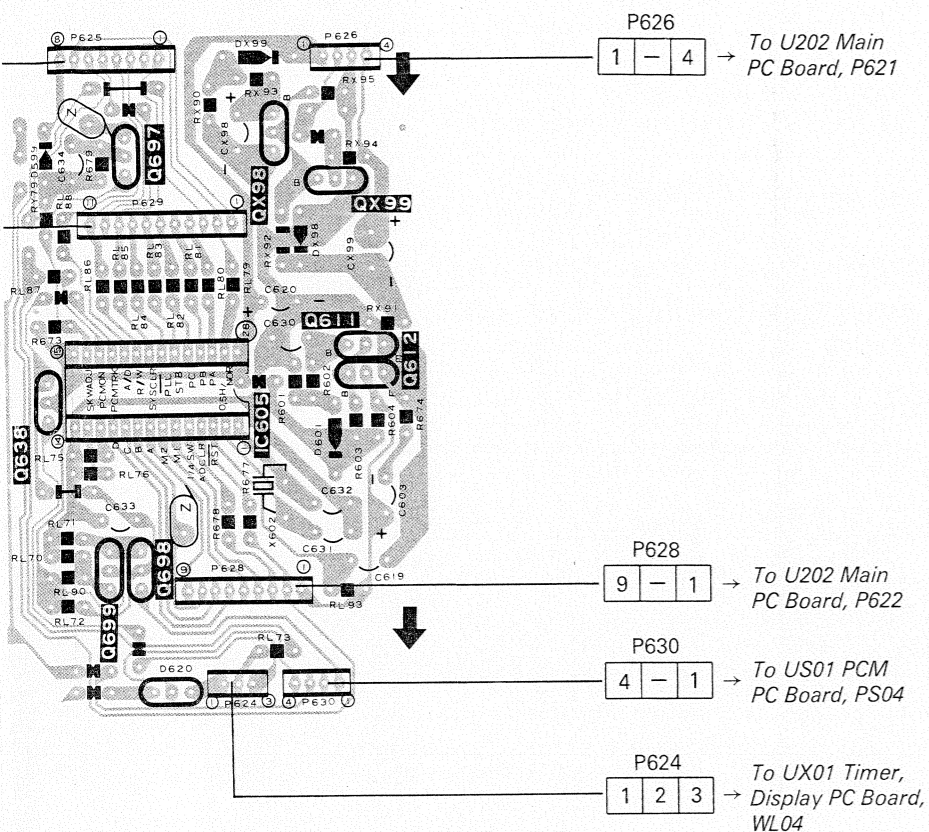
Symbol No.	Location
ICE01	D-16
ICE02	B-14
ICE03	B-14
ICE04	B-15
ICE05	C-14

UG02 Graphic Timer



11-2. Graphic Timer PC Board

U902 Sub Logic PC Board



Voltage and Location of Transistors

Location Diodes

Symbol No.	Location
DE02	D-14
DE03	D-14
DE04	C-14
DE05	D-14
DE06	D-14
DE07	D-14

Location of adjusting VR's

Symbol No.	Location
RE51	B-16

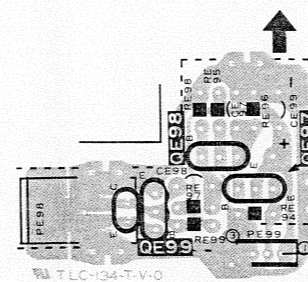
Location IC's

Symbol No.	Location
ICE01	D-16
ICE02	B-14
ICE03	B-14
ICE04	B-15
ICE05	C-14

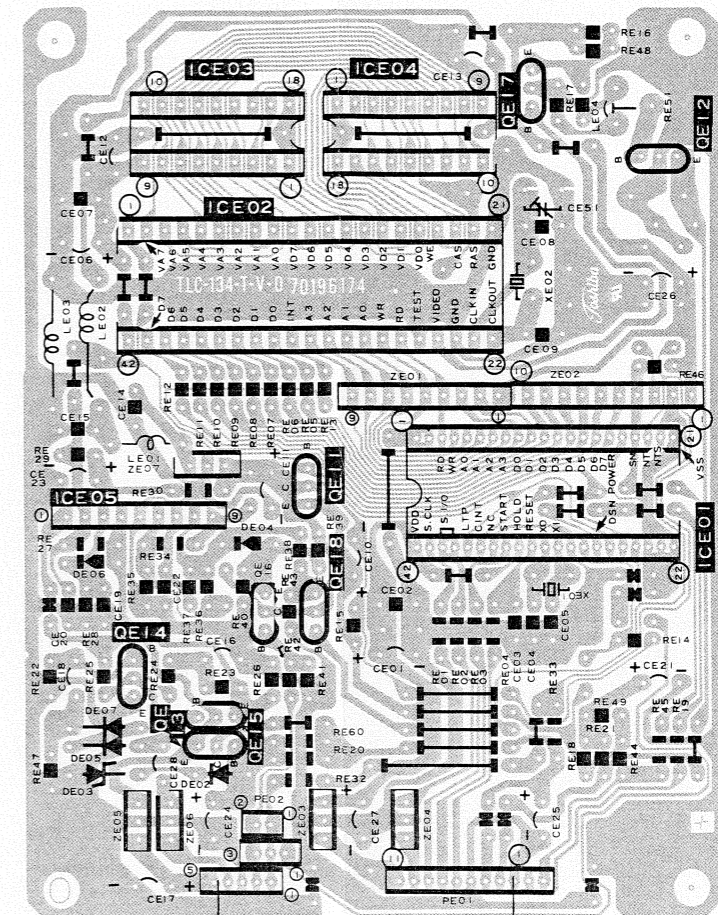
V : REC
(V) : PLAY

Symbol No.	Voltage(Unit:V)			Location
	E	C	B	
QE11	5.2	5.2	4.5	C-15
QE12	1.2	0	1.2	B-16
QE13	7.9	9.2	8.6	D-14
QE14	0	4.7	0.7	D-14
QE15	4.0	7.9	4.7	D-14
QE16	0.7	5.2	1.3	D-14
QE17	2.4	0	2.4	B-15
QE18	0(4.2)	5.2	0(4.8)	D-15
QE97	1.4	7.9	2.0	E-12
QE98	0.6	2.0	1.2	E-12
QE99	0	7.9	0.4	F-12

UG02 Graphic Timer Jack PC Board



UE01 Graphic Timer PC Board



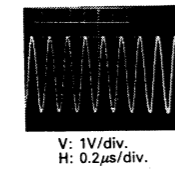
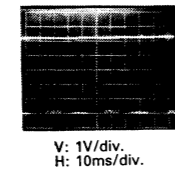
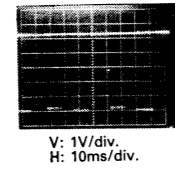
To U902 Hi-Fi
Audio PC Board,
P915

To U202 Main
PC Board, P615

To U202 Main
PC Board, P303

11-3. Graphic Timer Circuit

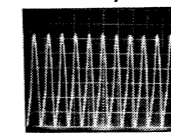
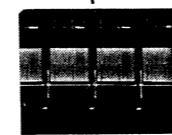
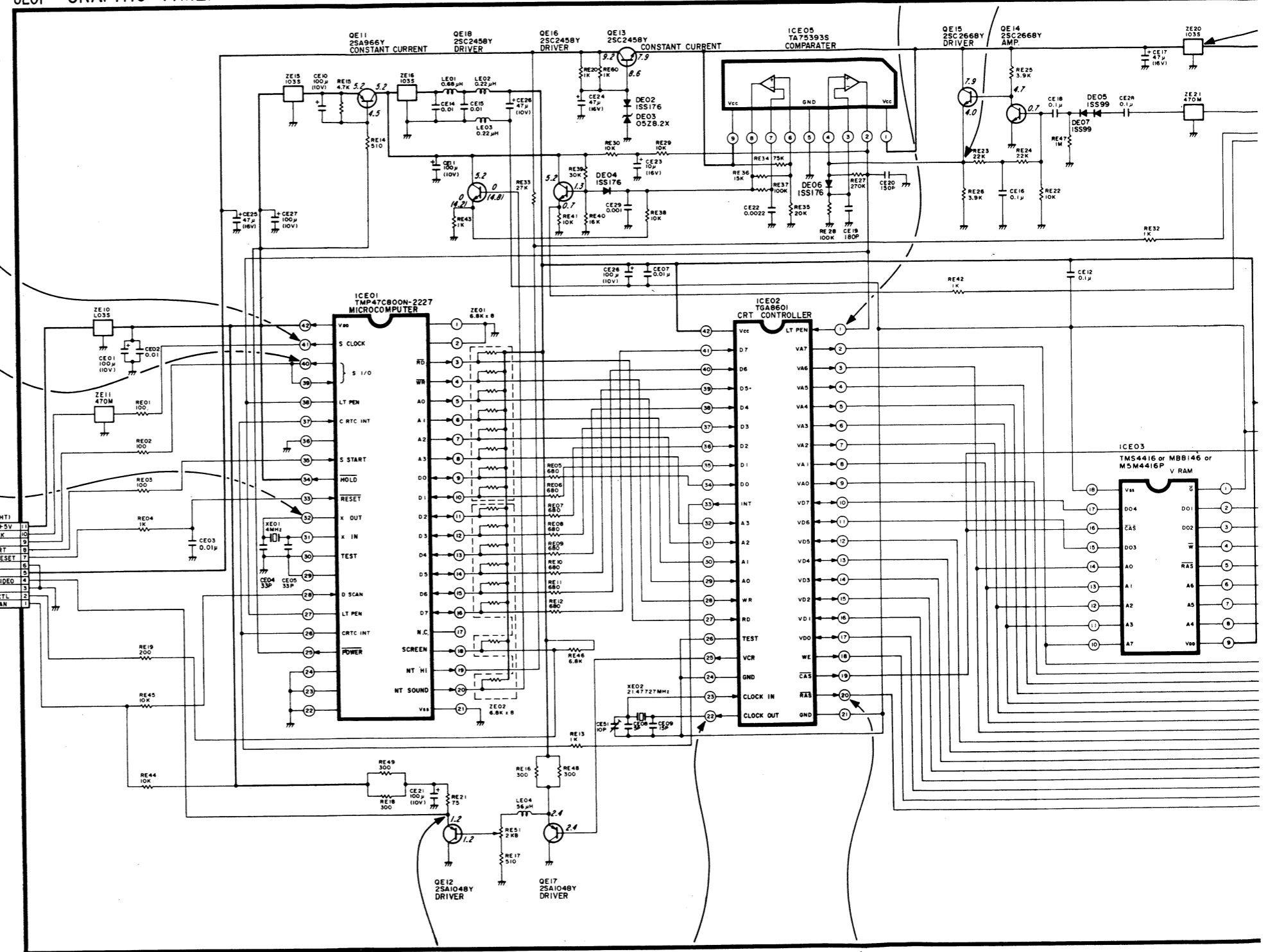
UE01 GRAPHIC TIMER



P.E.01 (WNT)	
WHT	EVER +5V
BLU	S CLOCK
BLU	S I/O
BLU	S START
BLU	SCREEN RESET
BLU	GND
WHT	+5V
WHT	SCREEN VIDEO
GRY	GND
BLU	SCREEN CTL
BLU	D SCAN

TO P615
U202 LOGIC

TO P303
U202 VIDEO

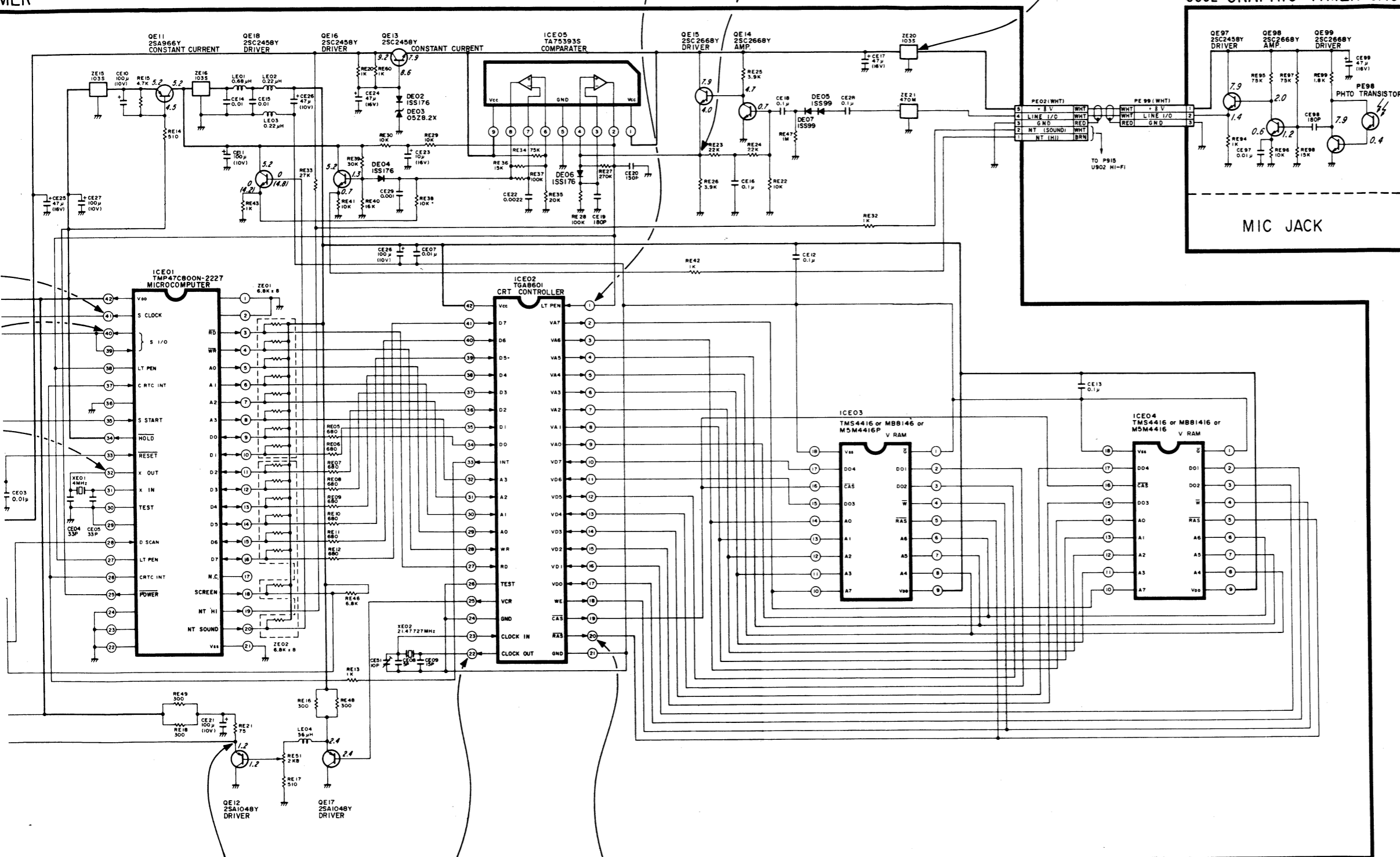


MER

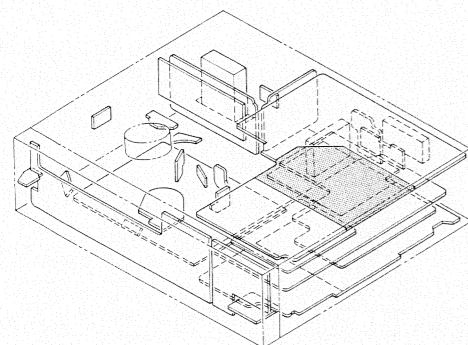
V: 1V/div.
H: 0.5ms/div.V: 1V/div.
H: 0.5ms/div.V: 1V/div.
H: 0.5ms/div.

UG02 GRAPHIC TIMER JACK

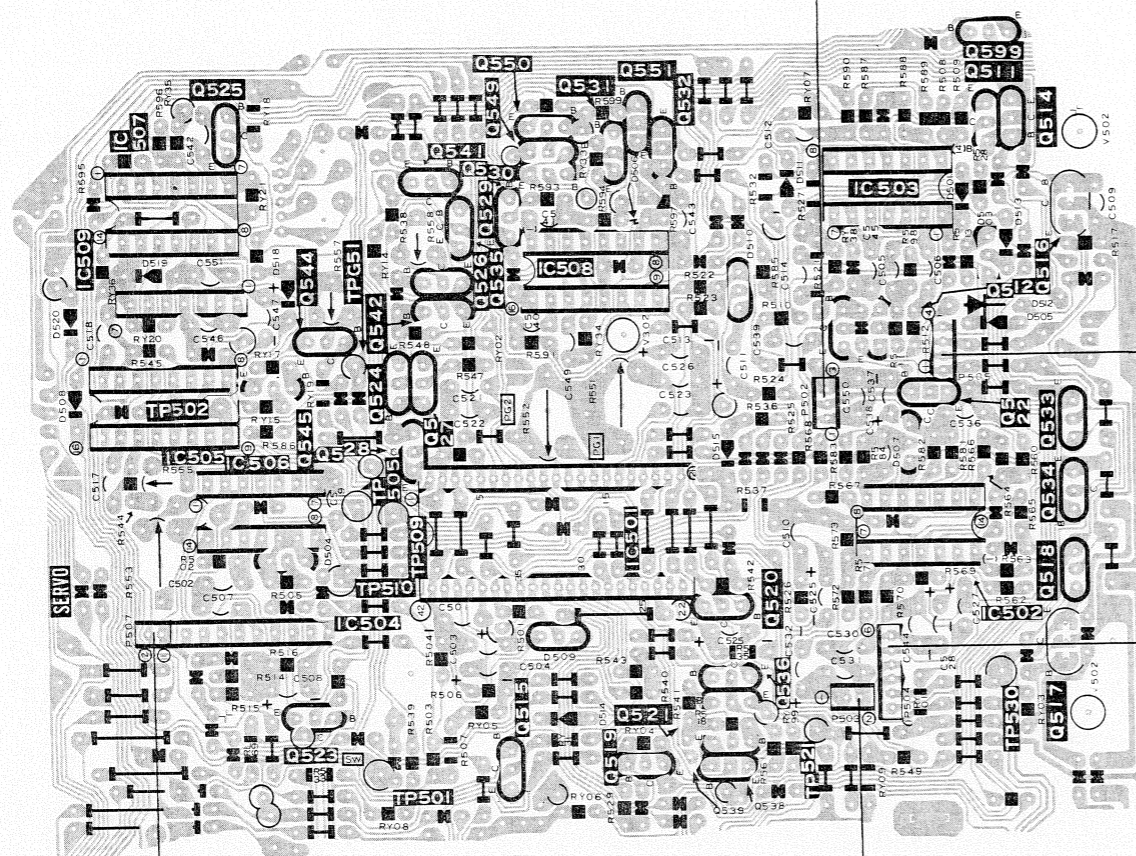
MIC JACK

V: 0.2V/div.
H: 20μs/div.V: 1V/div.
H: 50ns/div.V: 1V/div.
H: 0.2μs/div.

12-2. Servo PC Board



U202 Main (Servo) PC Board



P502
3
2
1
→ To UM07 ACE Head
Relay PC Board,
PM71

P505
4
1
→ To Capstan Motor

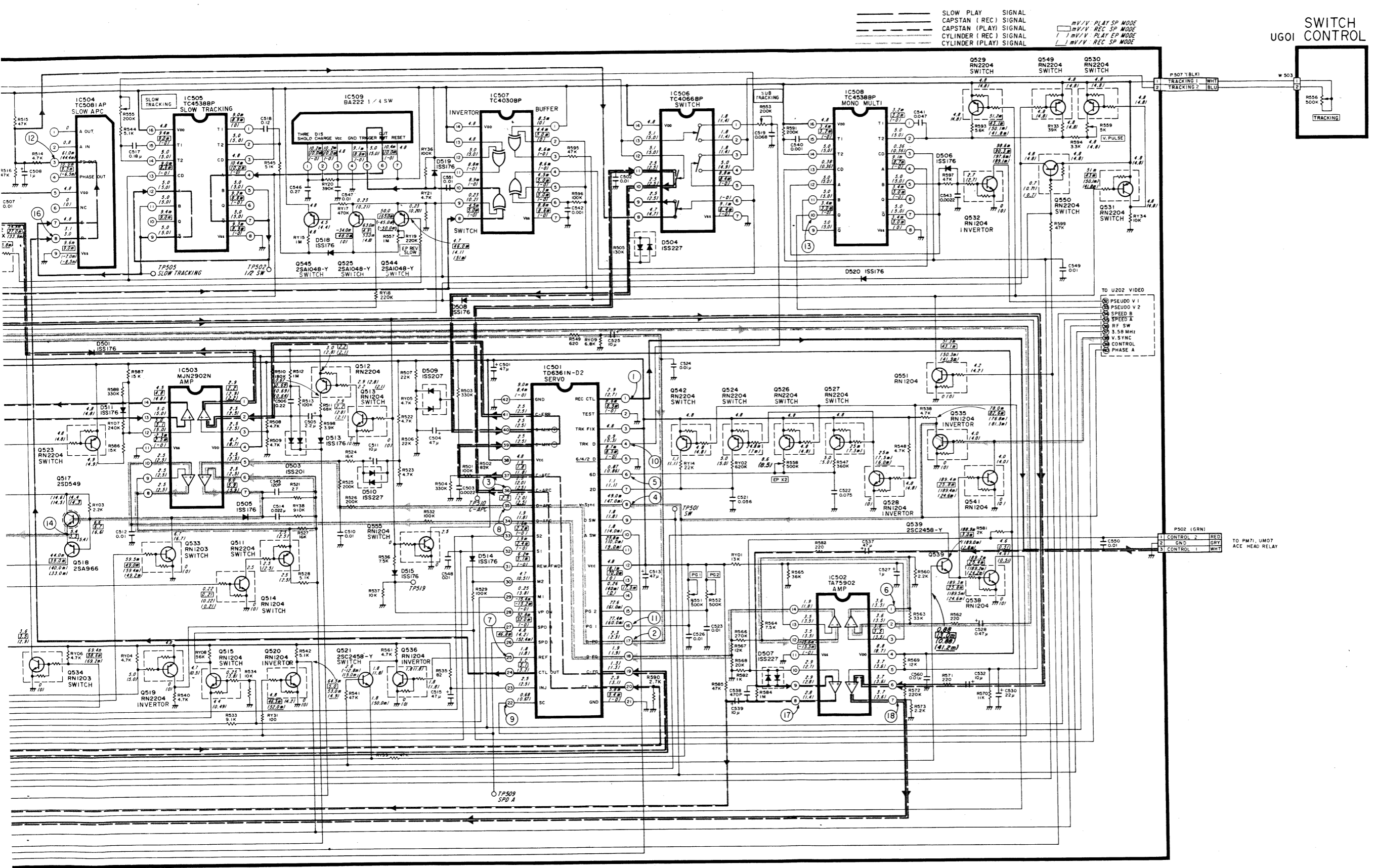
P504
6
1
→ To Cylinder Drive Unit

P507
2
1
→ To UG01 Switch
Control PC Board,
W503

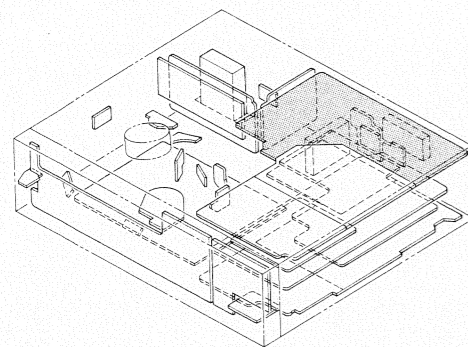
P503
1
2
→ To Capstan FG

Voltage and Location of Transistors

Voltage(Unit:V)							
Symbol No.	E		C		B		Loc
	PLAY	REC	PLAY	REC	PLAY	REC	
Q511	2.5(2.5)		2.5 (2.5)		2.5 (2.5)		C-
Q512	3.0(2.8)	2.2 (2.1)	0.67(0.69)	0.67(0.69)	2.9 (2.8)	2.2 (2.1)	D-
Q513	0 (0)	—	2.9 (2.8)	2.2 (2.1)	0 (0)	—	D-
Q514	0 (0)	—	2.5 (2.5)	—	0.22(0.22)	0.21(0.21)	C-
Q515	4.4 (0.49)	—	4.7 (0.5)	—	0.25 (3.8)	—	E-
Q516	2.3 (1.7)	—	14.6 (14.6)	14.4 (14.5)	3.5 (2.9)	—	D-
Q517	5.4 (5.4)	5.3	14.4 (14.6)	14.3 (14.5)	6.6 (6.6)	6.7	E-
Q518	5.4 (5.4)	5.3	44.0mV (40.0mV)	39.0mV (33.0mV)	6.6 (6.6)	6.7	E-
Q519	4.8		0(0)		5.0 (5.0)		E-
Q520	0 (0)		64.5mV (53.0mV)	5.0 (4.9)	4.8 (4.2)	46.5mV (52.0mV)	E-
Q521	1.8 (50mV)	1.8 (1.8)	1.8 (50mV)		2.8 (-12.8mV)	(15.0mV)	E-
Q522	0 (0)	—	2.1 (1.4)	—	34.9mV (33.9mV)	27.0mV (25.8mV)	D-
Q523	4.8 (4.8)	—	4.9 (4.9)	—	4.8(4.8)	—	E-
Q524	4.8		5.0 (5.0)		24.8mV (7mV)		D-
Q525	0.23 (0.21)	—	-34.0mV (0V)	48.0mV	63.0mV (53.0mV)	4.9 (4.8)	C-
Q526	4.8	—	8.6 (8.5)	—	4.8 (4.8)	—	D-
Q527	4.8	—	5.0 (5.0)	—	25mV(73mV)	—	D-
Q528	0 (0)	—	25mV (75mV)	(6.0)	4.8 (4.8)	—	D-
Q529	4.8 (4.8)	—	4.8 (4.8)	—	51.2mV (50.1mV)	43.1mV (41.8mV)	C-
Q530	4.8 (4.8)	—	4.8 (4.8)	—	4.8 (4.8)	—	C-
Q531	4.8 (4.8)	—	4.8 (4.8)	—	51mV (50.1mV)	43mV (41.8mV)	C-
Q532	0 (0)	—	98.6mV (97.6mV)	90.3mV (89.1mV)	2.7 (2.7)	—	C-
Q533	0 (0)		6.7 (6.7)		59.5mV (59.4mV)	49.0mV (49.2mV)	D-
Q534	0 (0)		3.6 (2.9)	3.5	69.4mV (69.2mV)	58.6	D-
Q535	0 (0)	—	78.0mV (76.8mV)	82.6mV (81.3mV)	4.0 (4.0)	—	D-
Q536	0 (0)	—	1.8 (1.8)	—	1.8 (1.8)	—	E-
Q538	0 (0)	—	4.6 (4.6)	0.51(0.51)	189.2mV (189.2mV)	25.4mV (24.2mV)	F-
Q539	189.3mV (189.5mV)	25.8mV (24.6mV)	188.9mV (189.0mV)	3.0mV (2.8mV)	0.88 (0.88)	13.0mV (41.2mV)	F-
Q541	0 (0)		4.0 (4.0)		189.4mV (189.4mV)	25.8mV (24.6mV)	C-
Q542	4.8	—	1.1 (1.1)	—	4.8 (4.8)	—	F-
Q544	0.23 (0.20)	—	50.0mV (-45.0mV)	165.0mV (-50.0mV)	4.7 (4.1)	46.0mV (51mV)	L-
Q545	4.8		4.8		4.5 (4.4)	—	F-
Q549	4.8 (4.8)	—	4.8 (4.8)	—	4.8 (4.8)	—	C-
Q550	4.8 (4.8)	—	4.8 (4.8)	—	0.70 (0.71)	(0.70)	F-
Q551	0 (0)	—	51.3mV (50.3mV)	43.1mV (49.1mV)	4.2 (4.2)	—	F-
Q555	0		2.5		0	—	C-



13-2. Video PC Board



U202 Main (Video) PC Board

U103 Sub Video PC Board

To UU01 Memory
Control PC Board,
PU01

P302
6 - 1

To US01 PCM
PC Board, PS03

P311
2 1

To UV01 Pre Amp
PC Board, PV02

P106
11 - 1

To U803 Power 2
PC Board, P808

P205
4
1
1

To UEG
PC Board

P303
1 - 5

To U902 Hi-Fi
Audio PC Board,
P905

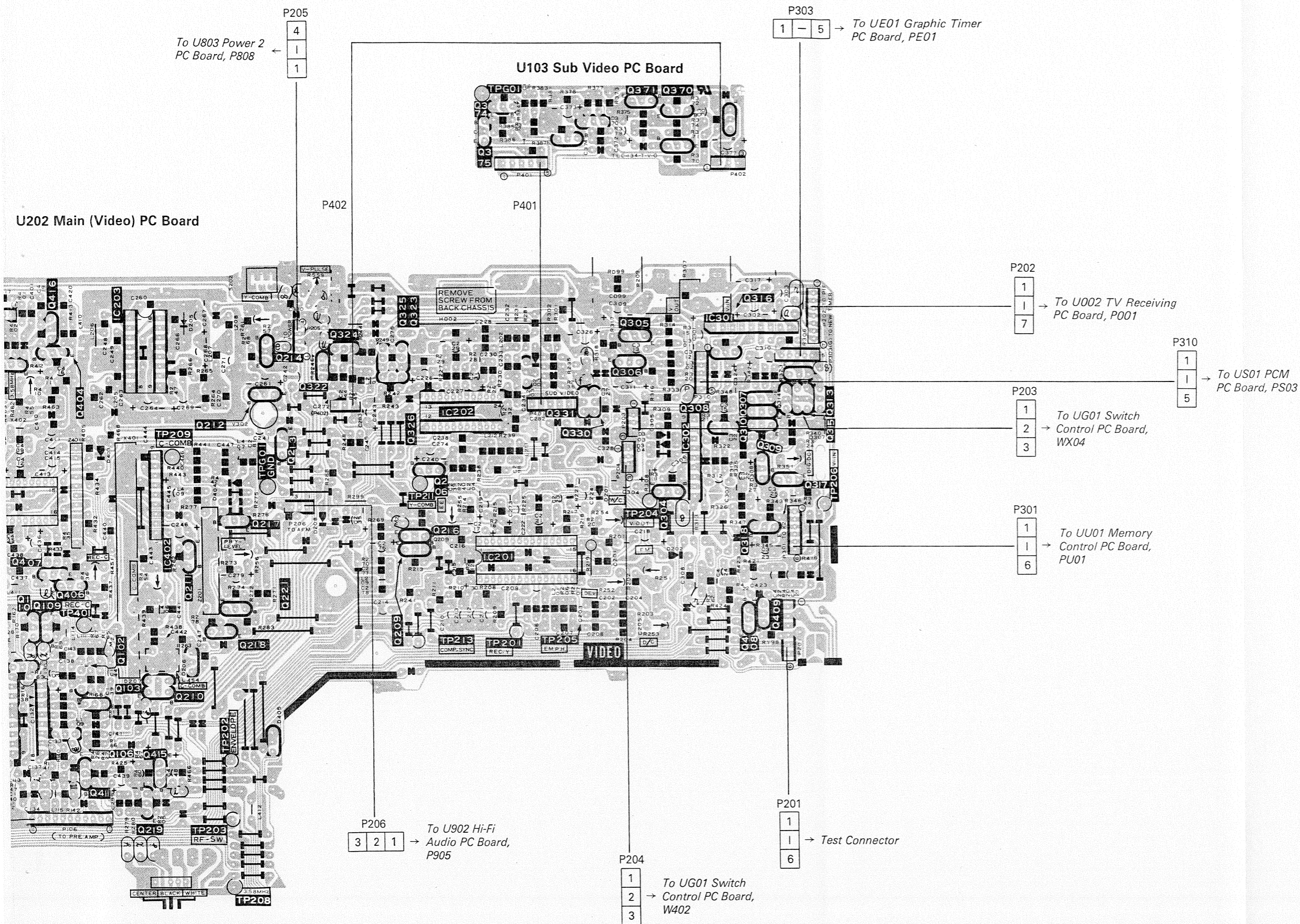
P206
3 2 1

To UG01 Switch
Control PC Board,
W402

P204
1
2
3

Test Connecto

P201
1
1
6



V : PLAY SP

[V]: PLAY EP

(V): REC SP

<V>: REC EP

Voltage and Location of Transistors

Symbol No.	Voltage(Unit:V)			Location
	E	C	B	
Q102	1.6 (0)	3.4 (0)	2.2 (0)	E-6
Q103	2.2 (0)	0 (0)	1.6 (0)	F-6
Q104	2.8 (0)	0 (0)	2.1 (0)	F-5
Q105	—	—	—	F-5
Q106	0 (0)	2.7 (0)	0 (0)	F-6
Q107	1.4 (0)	5.0 (0)	2.1 (0)	E-5
Q109	0 (0)	0 (0)	0 (0)	E-6
Q110	0 (0)	0 (0)	5.0 (0)	E-5
Q204	0 (0)	0 (0)	0.5 (0.5)	F-5
Q206	0 (0)	0 (0)	0(0)[4.4]<4.4>	D-9
Q209	0.6 (2.4)	0 (0)	1.6(1.7)	E-8
Q210	0 (0)	0 (0)	5.0 (0)	F-7
Q211	2.2 (2.4)	5.1 (5.1)	0.6 (0.6)	E-7
Q212	9.1 (9.0)	8.9 (0)	0 (8.9)	D-7
Q213	0 (0)	0 (8.9)	5.0 (0)	D-7
Q214	2.2 (0)	0 (0)	1.5 (0)	C-7
Q216	2.3 (2.4)	0 (0)	1.6 (1.7)	E-9
Q217	1.3 (0)	4.1 (4.2)	2.0 (0)	D-7
Q218	3.5 (3.6)	5.1 (5.1)	4.1 (4.2)	E-7
Q219	0 (2.5)	0.1 (5.1)	0 (2.8)	G-6
Q221	0 (0)	2.0 (0)	0.7 (0)	E-7
Q304	4.3 (4.3)	0 (0)	3.6 (3.6)	D-10
Q305	2.52.6	0 (0)	1.9 (1.9)	C-10
Q306	1.9 (1.9)	7.2 (7.2)	2.5 (2.5)	C-10
Q307	5.1 (5.1)	4.9 (4.9)	3.0	D-11
Q308	4.3 (4.3)	9.1 (9.0)	4.9 (4.9)	D-11
Q309	4.0 (4.0)	4.9 (4.9)	3.0	D-11
Q310	2.3 (2.3)	4.9 (4.9)	3.0	D-11
Q312	5.1 (5.1)	5.1 (5.1)	0.1 (0.1)	C-11
Q313	4.0 (4.0)	5.1 (5.1)	4.7 (4.7)	D-12
Q314	5.1 (5.1)	2.3 (2.3)	5.1 (5.1)	D-11
Q315	2.3 (2.3)	5.1 (5.1)	0.1 (0.1)	D-12
Q316	0 (0)	6.2 (6.1)	0 (0)	C-11
Q317	3.7 (3.7)	5.1 (5.1)	3.2 (3.2)	D-12
Q318	1.5 (1.6)	0 (0)	0.8 (0.9)	E-11
Q322	0 (0)	0 (0)	0 (0)	C-8
Q323	0 (0)	0 (0)	0 (0)	C-8
Q324	0 (0)	0 (0)	0 (0)	C-8
Q325	0 (0)	0 (0)	0 (0)	C-8
Q326	2.8 (2.9)	5.1 (5.1)	3.5 (3.5)	D-8
Q330	0 (0)	0 (0)	0 (0)	D-10
Q331	0 (0)	0 (0)	0 (0)	D-10
Q370	0 (0)	3.2 (3.2)	0.7 (0.7)	A-10
Q371	2.7 (2.7)	5.1 (5.1)	3.2 (3.2)	A-10
Q374	0.7 (0.7)	0 (0)	0 (0)	A-9
Q375	2.1 (0)	0 (0)	1.4 (1.4)	B-9
Q403	4.6 (4.6)	5.1 (5.1)	5.1 (5.1)	C-5
Q404	2.6 (2.6)	5.1 (5.1)	3.4 (3.4)	D-6
Q405	3.5 (3.5)	0	2.8 (2.8)	C-5
Q406	2.1 (1.4)	0 (0)	1.5 (0.7)	E-6
Q407	0 (0)	5.1 (5.1)	0 (0)	E-5
Q408	0 (0)	4.3 (4.3)	0 (0)	E-11
Q409	0 (0)	0 (0)	5.0 (0)	E-11
Q411	0[4.4](0)<4.4>	5.1	0[5.0](0)<5.1>	F-6
Q415	0.1 (5.1)	5.1 (5.1)	0 (5.9)	F-6
Q416	3.3 (3.3)	0 (0)	2.6 (2.6)	C-6

Location of Diodes

Symbol No.	Location
D201	D-10
D202	E-10
D203	C-9
D205	C-7
D206	F-7
D207	F-6
D208	D-8
D303	D-10
D304	D-10
D307	D-12
D308	D-11
D403	D-6
D404	D-7
D405	F-7

Location of adjusting VR's


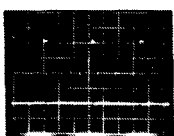

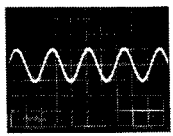


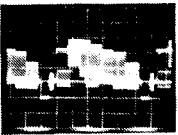
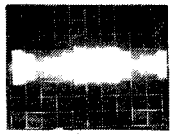

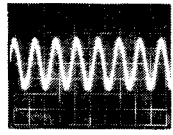
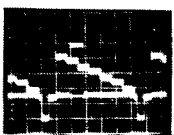

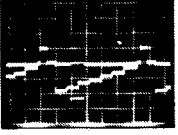

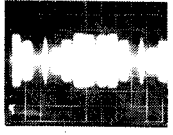
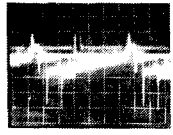
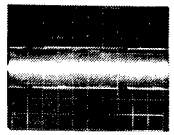

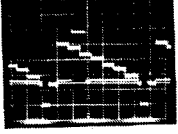
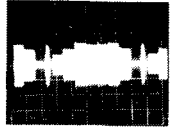


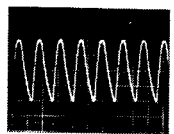
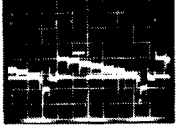
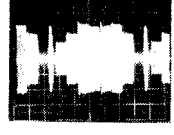
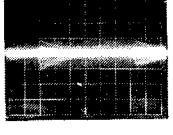
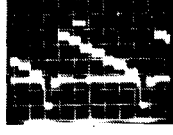

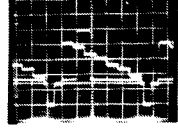


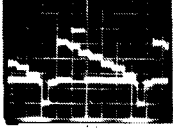
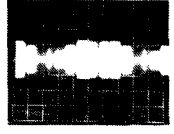
Symbol No.	Location
R251	E-10
R252	E-10
R253	E-10
R254	D-10
R255	D-9
R256	E-7
R257	C-7
R351	D-11
R451	E-6
R454	E-6
R455	D-5
R559	C-8

Location of IC's

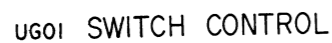
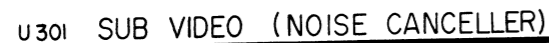
Symbol No.	Location
IC101	F-5
IC201	E-9
IC202	D-9
IC203	C-6
IC301	C-11
IC302	D-11
IC401	D-5
IC402	E-7

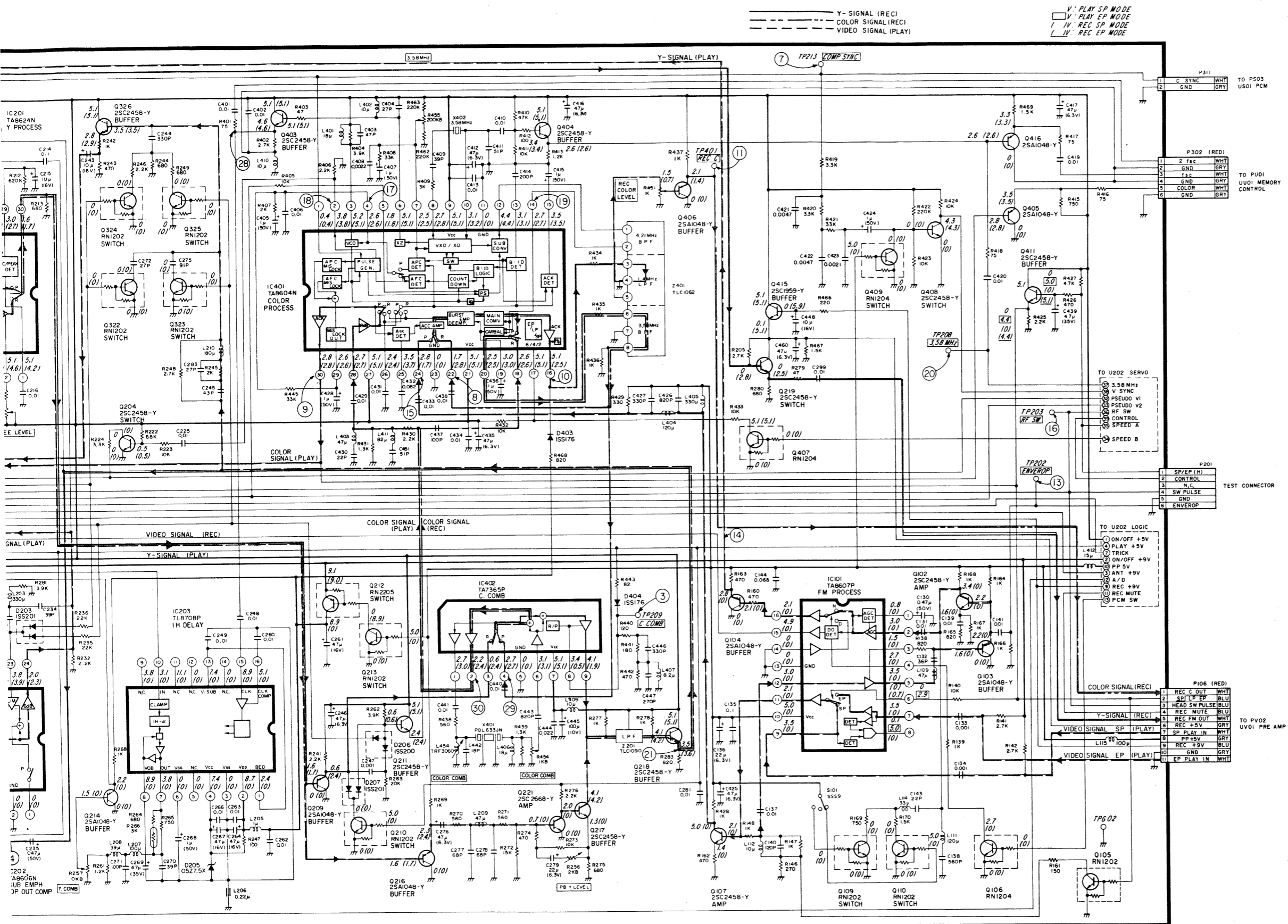
Record Mode

Playback Mode

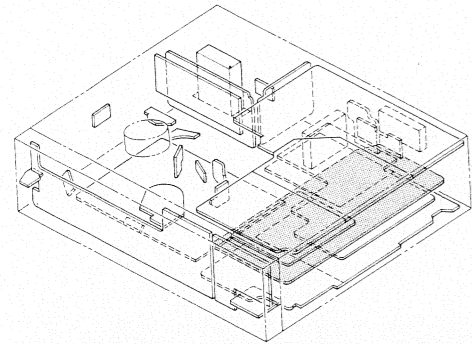
<p>① TP206</p>  <p>V: 0.2V/div. H: 20μs/div. C-7</p>	<p>⑦ TP213</p>  <p>V: 1V/div. H: 20μs/div. A-16</p>	<p>⑬ TP202</p>  <p>V: 0.1V/div. H: 5ms/div. D-18</p>	<p>⑲ IC401, Pin ⑭</p>  <p>V: 0.2V/div. H: 100ns/div. B-14</p>	<p>⑳ Q374, Emitter</p>  <p>V: 50mV/div. H: 10μs/div. D-2</p>	<p>⑳ IC201, Pin ⑧</p>  <p>V: 0.2V/div. H: 10μs/div. D-9</p>
<p>② TP204</p>  <p>V: 0.1V/div. H: 10μs/div. D-6</p>	<p>⑧ IC401, Pin ⑳</p>  <p>V: 0.1V/div. H: 10μs/div. D-13</p>	<p>⑭ Q104, Emitter</p>  <p>V: 0.5V/div. H: 5ms/div. E-15</p>	<p>⑳ TP208</p>  <p>V: 0.1V/div. H: 200ns/div. C-17</p>	<p>㉑ IC202, Pin ⑥</p>  <p>V: 0.1V/div. H: 10μs/div. G-10</p>	<p>㉒ TP204</p>  <p>V: 0.5V/div. H: 10μs/div. D-6</p>
<p>③ TP209</p>  <p>V: 0.5V/div. H: 10μs/div. E-15</p>	<p>⑨ IC401, Pin ㉑</p>  <p>V: 0.2V/div. H: 10μs/div. D-12</p>	<p>⑮ IC401, Pin ㉒</p>  <p>V: 50mV/div. H: 10μs/div. D-13</p>	<p>㉑ Q218, Emitter</p>  <p>V: 0.1V/div. H: 10μs/div. F-15</p>	<p>㉒ TP211 (Y comb)</p>  <p>V: 0.5V/div. H: 10μs/div. G-9</p>	<p>㉓ Q317, Emitter</p>  <p>V: 0.2V/div. H: 10μs/div. G-6</p>
<p>④ IC202, Pin ③</p>  <p>V: 0.1V/div. H: 10μs/div. G 10</p>	<p>⑩ IC401, Pin ⑮</p>  <p>V: 0.5V/div. H: 10μs/div. C-14</p>	<p>⑯ TP203</p>  <p>V: 1V/div. H: 5ms/div. D-18</p>	<p>㉒ IC202, Pin ⑩</p>  <p>V: 0.1V/div. H: 10μs/div. G-9</p>	<p>㉒ Q403, Emitter</p>  <p>V: 0.2V/div. H: 100ns/div. B-12</p>	
<p>⑤ TP205</p>  <p>V: 0.2V/div. H: 10μs/div. C-8</p>	<p>⑪ TP401 (Rec-C)</p>  <p>V: 50mV/div. H: 10μs/div. B-16</p>	<p>⑰ IC401, Pin ④</p>  <p>V: 0.1V/div. H: 10μs/div. B-13</p>	<p>㉓ IC202, Pin ⑪</p>  <p>V: 0.1V/div. H: 10μs/div. G-9</p>	<p>㉓ IC402, Pin ④</p>  <p>V: 0.1V/div. H: 10μs/div. F-14</p>	
<p>⑥ IC210, Pin ㉓</p>  <p>V: 0.1V/div. H: 10μs/div. B-10</p>	<p>⑫ TP201 (Rec-Y)</p>  <p>V: 0.5V/div. H: 10μs/div. B-9</p>	<p>⑱ IC401, Pin ②</p>  <p>V: 1V/div. H: 20μs/div. B-12</p>	<p>㉔ IC201, Pin ⑥</p>  <p>V: 0.1V/div. H: 10μs/div. D-9</p>	<p>㉔ IC402, Pin ②</p>  <p>V: 0.1V/div. H: 10μs/div. F-13</p>	

U202 VIDEO

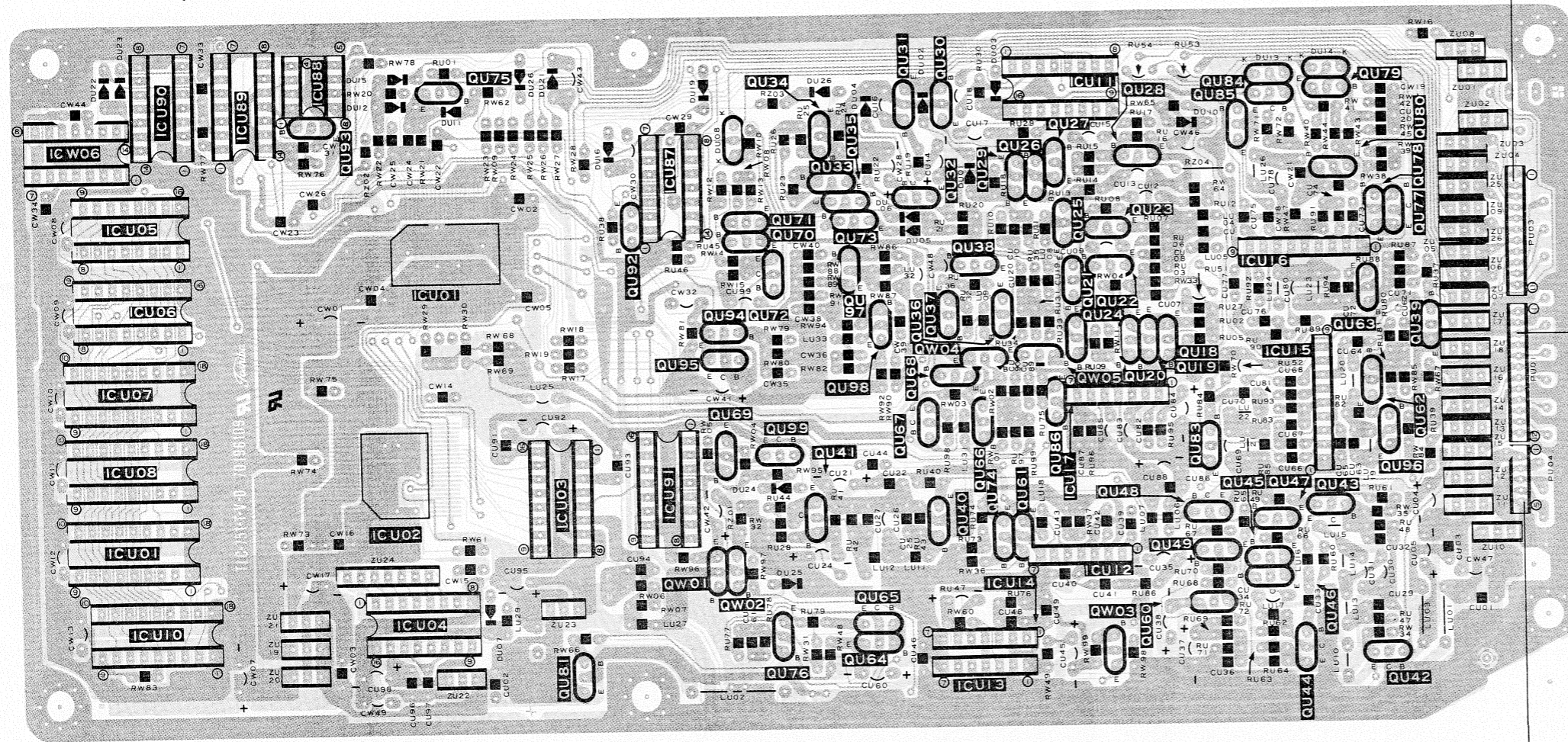




14-2. Memory Control PC Board



UU01 Memory Control PC Board
(Bottom View)



PU03
1
11
→ To U902 Sub
Logic PC Board,
P629

PU01
1
6
12
7
12
→ To U202 Main
PC Board, P302
→ To U202 Main
PC Board, P301

PU04
1
2
3
→ To U803 Power 2
PC Board, P805

A
B
C
D
E
F
G

PU03
1
11
To U902 Sub
Logic PC Board,
P629

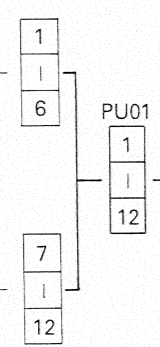
UU01 Memory Control PC Board
(Top View)

To U202 Main
PC Board, P302

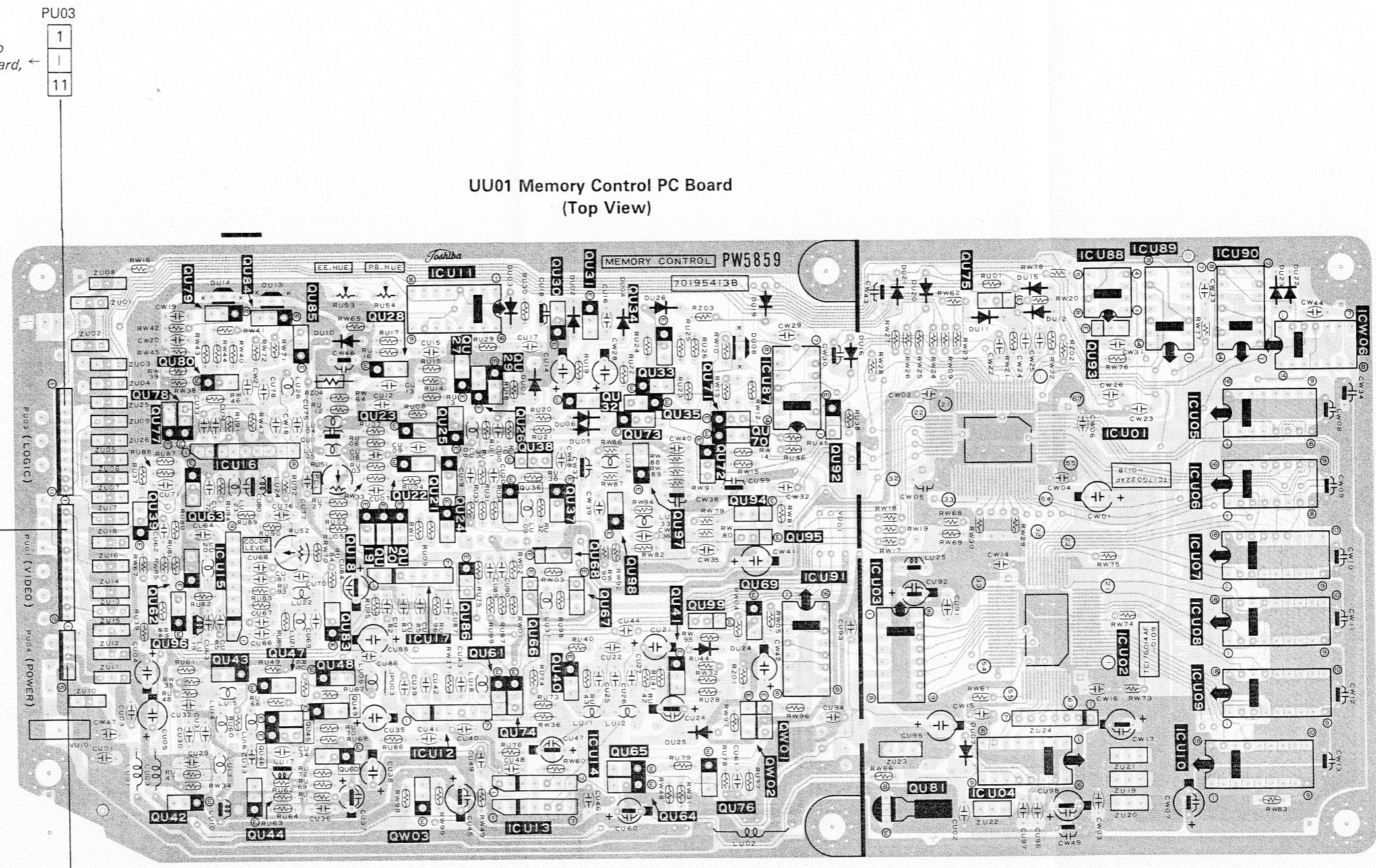
To U202 Main
PC Board, P301

To U202 Main
PC Board, P302

To U202 Main
PC Board, P301



PU04
1
2
3
To U803 Power 2
PC Board, P805



V : EE MULTI STILL
(V): EE MUTLI SERIES
[V]: PLAYBACK STILL

Voltage and Location of Transistors

Symbol No.	Voltage(Unit:V)			Location
	E	C	B	
QU18	8.2(8.2) [8.2]	0.02(0.02) [0.01]	7.5(7.5) [7.5]	D-4
QU19	8.2(8.2) [8.2]	5.8(5.8) [5.8]	7.8(7.8) [7.9]	D-4
QU20	5.8(5.8) [5.8]	7.8(7.8) [7.9]	6.4(6.4) [6.5]	D-5
QU21	7.2(7.2) [7.3]	8.6(8.6) [8.6]	7.8(7.8) [7.9]	D-5
QU22	2.2(2.2) [1.7]	5.8(5.8) [5.8]	2.9(2.9) [2.4]	D-5
QU23	2.2(2.2) [1.7]	7.2(7.2) [7.3]	2.9(2.9) [2.4]	C-5
QU24	7.2(7.2) [7.3]	8.5(8.5) [8.5]	7.8(7.8) [7.9]	D-5
QU25	2.9(2.9) [2.4]	8.6(8.6) [8.6]	3.4(3.4) [2.9]	D-5
QU26	3.4(3.4) [3.0]	3.5(3.5) [3.1]	0.2(0.2) [0.2]	C-5
QU27	3.5(3.5) [3.1]	3.4(3.4) [3.0]	0.2(0.2) [0.2]	C-5
QU28	0.02(0.02) (0.01)	0.2(0.2) [0.2]	0.7(0.7) [0.7]	C-5
QU29	3.5(3.5) [3.1]	8.6(8.6) [8.6]	4.1(4.1) [3.6]	C-6
QU30	3.5(3.5) [3.1]	0.02(0.02) [0.01]	3.0(3.0) [2.5]	C-6
QU31	3.0(3.0) [2.5]	0.02(0.02) [0.01]	2.3(2.3) [1.8]	C-6
QU32	2.3(2.3) [1.8]	8.6(8.6) [8.6]	0.6(0.6 or 1.0) (0.6)	C-6
QU33	2.3(2.3) [1.8]	8.6(8.6) [8.6]	2.9(2.3 or 2.9) (2.4)	C-6
QU34	0.02(0.02) [0.01]	2.9(2.3 or 2.9) [2.4]	0.06(0.06 or 0.2) [0.06]	C-7
QU35	0.02(0.02) (0.01)	0.06(0.06 or 1.6) [0.06]	4.8(3.7 or 4.8) [4.8]	C-6
QU36	7.3(7.3) [7.3]	0 (0) (0)	6.7 (6.7) [6.7]	D-6
QU37	7.3(7.3) [7.3]	5.4(5.4) [5.4]	6.7(6.7) [6.7]	D-6
QU38	5.4(5.4) [5.4]	2.3(2.3) [2.3]	4.7(4.7) [4.7]	D-6
QU39	0 (0) [0]	0.07(0.07) [0.07]	1.9 (1.9) [1.9]	D-3
QU40	1.7 (1.7) [1.7]	0 (0) [0]	1.1(1.1) [1.1]	E-6
QU41	2.7 (2.7) [2.7]	1.1 (1.1) [1.1]	2.1 (2.1) [2.1]	E-6
QU42	2.2 (2.2) [2.3]	0 (0) [0]	1.6 (1.6) [1.7]	F-3
QU43	2.9 (2.9) [2.9]	5.7 (5.7) [5.7]	3.5 (3.5) [3.6]	E-4
QU44	2.2 (2.2) [2.2]	6.5 (6.5) [6.5]	2.9 (2.9) [2.9]	F-4
QU45	1.5 (1.5) [1.6]	8.7 (8.7) [8.7]	0.1 (0.1) [0.2]	E-4
QU46	1.5 (1.5) [1.6]	8.7 (8.7) [8.7]	2.2 (2.2) [0.06]	F-4
QU47	0 (0) (0)	0.1 (0.1) [0.2]	0.7 (0.7) [0.06]	E-4
QU48	0 (0) (0)	2.2 (2.2) [0.06]	0.3 (0.3) [4.8]	E-5
QU49	2.8 (2.8) [2.8]	1.0 (1.0) [1.0]	2.1 (2.1) [2.1]	E-5
QU60	1.7 (1.7) [1.7]	0 (0) [0]	1.0 (1.0) [1.0]	F-5
QU61	1.9 (1.9) [1.9]	8.7 (8.7) [8.7]	2.6 (2.6) [2.6]	E-5
QU62	2.4(2.4) [2.4]	8.7 (8.7) [8.7]	3.0 (3.0) [3.0]	E-3
QU63	5.2 (5.2) [5.2]	8.7 (8.7) [8.7]	5.8 (5.8) [5.8]	D-4
QU64	4.2 (4.2) [4.3]	4.8 (4.8) [4.8]	4.5 (4.5) [4.5]	F-6
QU65	3.8 (3.8) [3.8]	4.8 (4.8) [4.8]	4.5 (4.5) [4.5]	E-6
QU66	7.3 (7.3) [7.3]	0 (0) (0)	6.7 (6.7) [6.7]	E-6
QU67	7.3 (7.3) [7.3]	5.4 (5.4) [5.4]	6.7 (6.7) [6.7]	E-6
QU68	5.4 (5.4) [5.4]	2.6 (2.6) [2.6]	4.7 (4.7) (4.7)	D-6
QU69	3.6 (3.6) [3.6]	4.8 (4.8) [4.8]	4.2 (4.3) [4.3]	E-7
QU70	0 (0) [0]	0.01(0.02or0.08) [0.2]	0.6 (0.6) [0.6]	D-7
QU71	0 (0) [0]	4.0 (4.0) [3.9]	0.01(0.02or0.08) [0.2]	D-7
QU72	4.2 (4.2) [4.2]	4.7 (4.7) [4.7]	4.7 (4.7 or 3.7) [4.8]	D-7
QU73	0.5 (0.5 or 0.8) [0.5]	0.01(0.01) [0.01]	2.0 (2.0) [2.0]	D-6
QU74	0 (0) (0)	2.6 (2.6) [2.6]	0.07(0.07) [0.07]	E-5
QU75	4.3 (2.4) [4.3]	4.7 (4.7) [4.7]	4.6 (0) [4.7]	C-8

Symbol No.	Voltage(Unit:V)			Location
	E	C	B	
QU76	4.5 (4.5) [4.5]	0 (0) [0]	3.8 (3.8) [3.8]	F-7
QU77	0 (0) [0]	0 (0) [8.6]	7.2 (7.2) [0.1]	C-3
QU78	0 (0) [0]	7.2 (7.2) [0.1]	0.3 (0.3) [4.8]	C-3
QU79	3.7 (3.7) [3.7]	8.7 (8.7) [8.7]	4.4 (4.4) (4.3)	C-4
QU80	4.4 (4.4) [4.4]	8.7 (8.7) [8.7]	5.1 (5.1) [5.1]	C-3
QU81	4.7 (4.7) [4.7]	4.8 (4.8) [4.8]	5.5 (5.5) [5.5]	F-8
QU83	0.6 (0.6) [0.6]	0 (0) [0]	0 (0) [1.4]	E-4
QU84	2.9 (2.9) [2.1]	0 (0) [0]	2.3 (2.3) [1.4]	C-4
QU85	1.7 (1.7) [1.7]	0 (0) [0]	1.1 (1.1) [1.1]	C-4
QU86	2.3 (2.3) [2.3]	4.8 (4.8) [4.8]	2.8 (2.8) [2.8]	E-5
QU92	0 (0) [0]	0 (0) [0]	4.1 (4.1) [3.9]	D-7
QU93	0 (0) [0]	2.2 (2.2) [2.2]	2.6 (2.6) [2.6]	C-9
QU94	0.79 (0.79) [2.4]	4.8 (4.8) [4.8]	1.19 (1.19) (3.0)	D-7
QU95	0.79 (0.79) [2.4]	4.8 (4.8) [4.8]	1.3 (1.3) [1.3]	D-7
QU96	3.6 (3.6) [3.6]	0 (0) [0]	3.0 (3.0) [3.0]	E-3
QU97	2.0 (2.0) [2.0]	3.5 (3.5) [3.5]	2.6 (2.6) [2.6]	D-6
QU98	1.3 (1.3) [1.3]	3.5 (3.5) [3.5]	1.9 (1.9) [1.9]	D-6
QU99	4.8 (4.8) [4.8]	4.8 (4.8) [4.8]	0.02(0.02) [0.02]	E-7
QW01	4.2 (4.2) [4.3]	4.8 (4.8) [4.8]	4.5 (4.5) [4.5]	E-7
QW02	2.2 (2.2) [2.3]	0 (0) [0]	1.6 (1.6) [1.7]	E-7
QW03	1.6 (1.6) [1.6]	8.7 (8.7) [8.7]	2.2 (2.2) [2.3]	F-5
QW04	—	—	—	D-6
QW05	—	—	—	D-5

Location of Diodes

Symbol No.	Location
DU01	C-6
DU02	C-6
DU03	C-5
DU04	C-6
DU05	D-6
DU06	C-6
DU07	F-8
DU10	C-4
DU11	C-8
DU12	C-9
DU13	C-4
DU14	C-4
DU15	C-9
DU16	C-7
DU19	C-7
DU20	C-8
DU21	C-8
DU22	C-10
DU23	C-10
LD24	E-7
DU25	E-6
DU26	C-6

Location of IC's

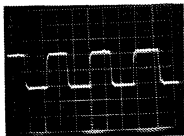
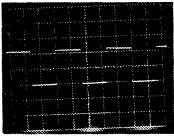
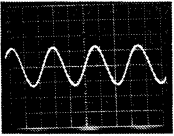
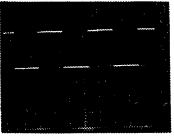
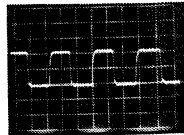

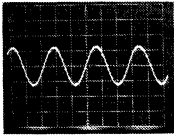
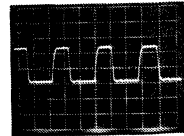
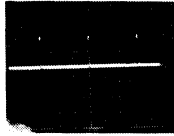
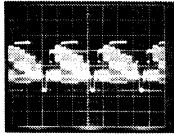
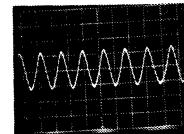
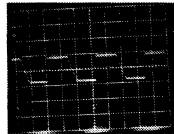

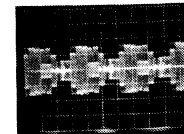
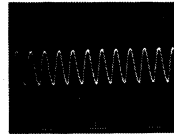



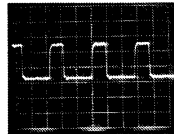
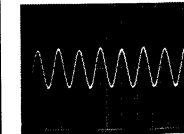
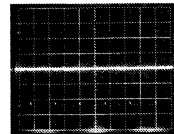


Symbol No.	Location
ICU01	D-8
ICU02	E-8
ICU03	E-8
ICU04	F-8
ICU05	D-10
ICU06	D-10
ICU07	D-10
ICU08	E-10
ICU09	E-10
ICU10	F-10
ICU11	C-5
ICU12	E-5
ICU13	F-6
ICU14	E-5
ICU15	D-4
ICU16	D-4
ICU17	E-5
ICU87	C-7
ICU88	C-9
ICU89	C-9
ICU90	C-10
ICU91	E-7
ICW06	C-10

Location of adjusting VR's

Symbol No.	Location
RU51	D-4
RU52	D-4
RU53	C-4
RU54	C-5

EE Mode Multi Scan

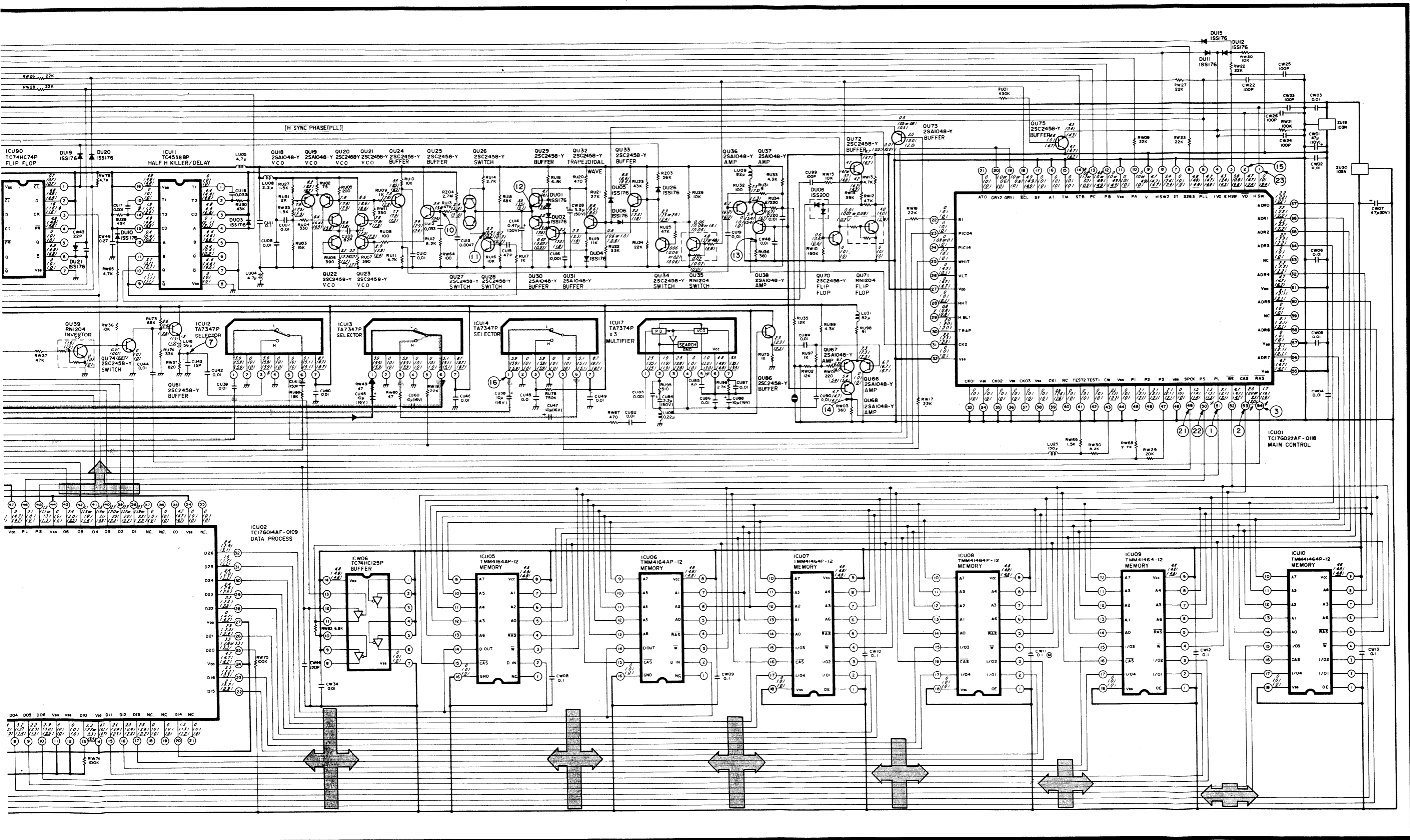
PB Mode

<p>① ICU01, Pin ⑤ (PL) D-20</p>  <p>V: 2V/div. H: 0.1μs/div.</p>	<p>⑨ ZU03 B-2</p>  <p>V: 2V/div. H: 10ms/div.</p>	<p>⑰ QU83, Emitter F-5</p>  <p>V: 200mV/div. H: 0.2μs/div.</p>	<p>⑳ ICU01, Pin ① B-20</p>  <p>V: 2V/div. H: 10ms/div.</p>
<p>② ICU01, Pin ⑤ (CAS) D-20</p>  <p>V: 2V/div. H: 0.1μs/div.</p>	<p>⑩ QU25, Base C-13</p>  <p>V: 50mV/div. H: 50ns/div.</p>	<p>⑱ QU80, Emitter F-6</p>  <p>V: 200mV/div. H: 0.2μs/div.</p>	
<p>③ ICU01, Pin ⑤ (RAS) D-20</p>  <p>V: 2V/div. H: 0.1μs/div.</p>	<p>⑪ QU28, Collector C-14</p>  <p>V: 2V/div. H: 20μs/div.</p>	<p>⑲ ICU04, Pin ⑫ G-7</p>  <p>V: 200mV/div. H: 20μs/div.</p>	
<p>④ PU01, Pin ③ F-2</p>  <p>V: 100mV/div. H: 0.2μs/div.</p>	<p>⑫ QU30, Emitter B-14</p>  <p>V: 2V/div. H: 20μs/div.</p>	<p>⑳ QU46, Emitter D-6</p>  <p>V: 100mV/div. H: 20μs/div.</p>	
<p>⑤ PU01, Pin ⑤ F-2</p>  <p>V: 200mV/div. H: 20μs/div.</p>	<p>⑬ QU38, Collector C-16</p>  <p>V: 1V/div. H: 50ns/div.</p>	<p>㉑ ICU01, Pin ④ (SPCK) D-20</p>  <p>V: 2V/div. H: 50ns/div.</p>	
<p>⑥ QU42, Base D-4</p>  <p>V: 200mV/div. H: 20μs/div.</p>	<p>⑭ QU68, Collector D-17</p>  <p>V: 1V/div. H: 50ns/div.</p>	<p>㉒ ICU01, Pin ⑤ (PS) D-20</p>  <p>V: 2V/div. H: 0.1μs/div.</p>	
<p>⑦ CU43 (+) D-11</p>  <p>V: 100mV/div. H: 0.2μs/div.</p>	<p>⑮ ICU01, Pin ② B-20</p>  <p>V: 2V/div. H: 10ms/div.</p>		
<p>⑧ ZU13 G-2</p>  <p>V: 100mV/div. H: 20μs/div.</p>	<p>⑯ ICU14, Pin ① D-14</p>  <p>V: 200mV/div. H: 20μs/div.</p>		

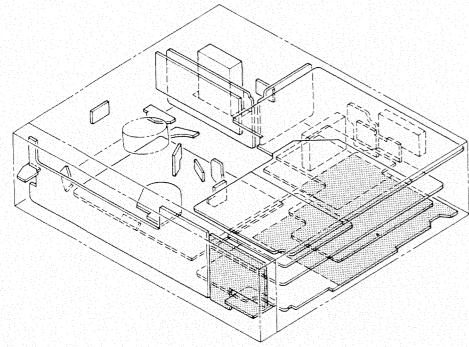
SCREEN 1 VIDEO SIGNAL
SCREEN 4 VIDEO SIGNAL
SCREEN 4 Y SIGNAL
SCREEN 4 COLOR SIGNAL

DIGITAL SIGNAL

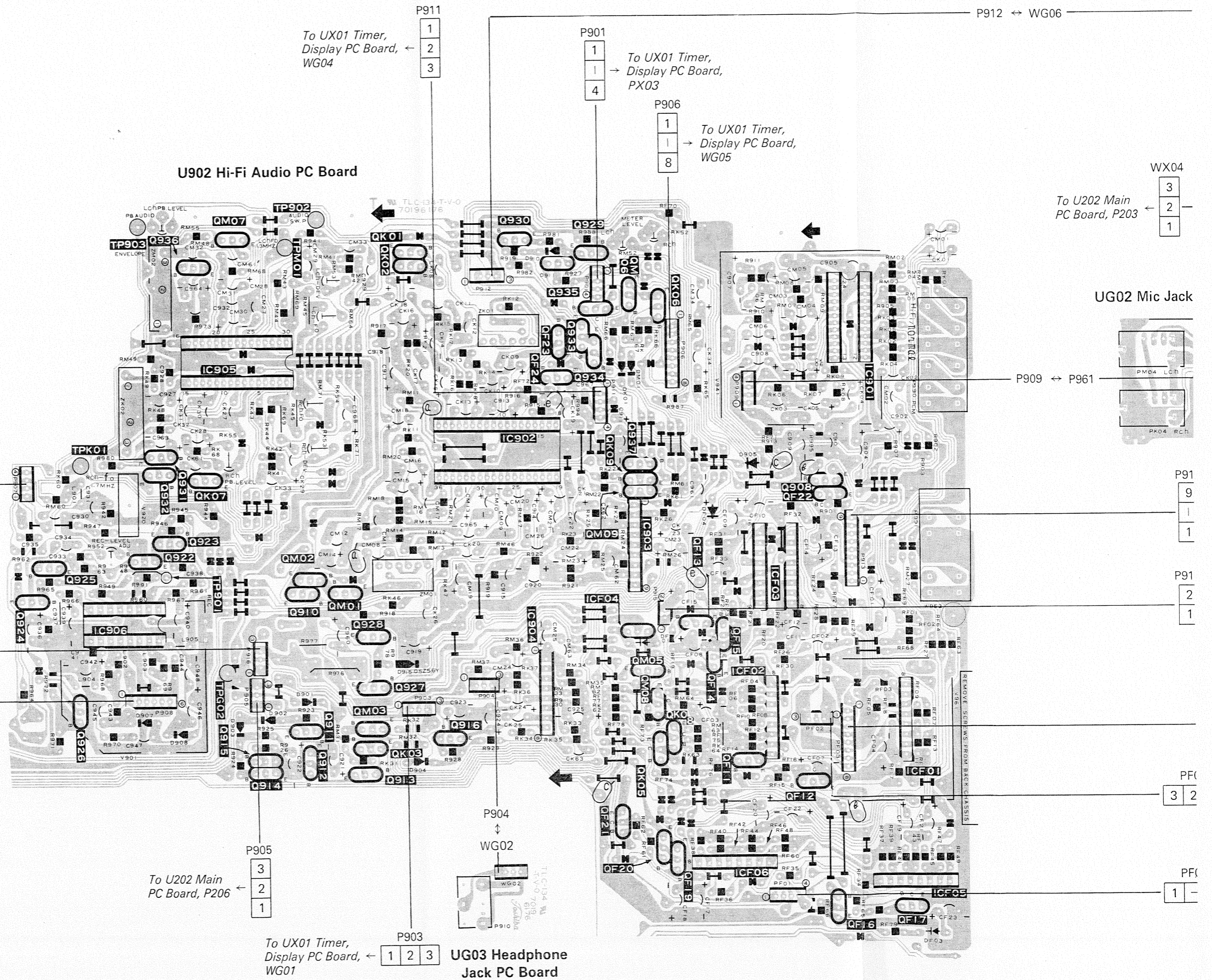
V: EE STILL
I: EE MULTI SCAN
L:V: PLAY STILL
!&: When voltage is measured, picture is deformed temporarily.

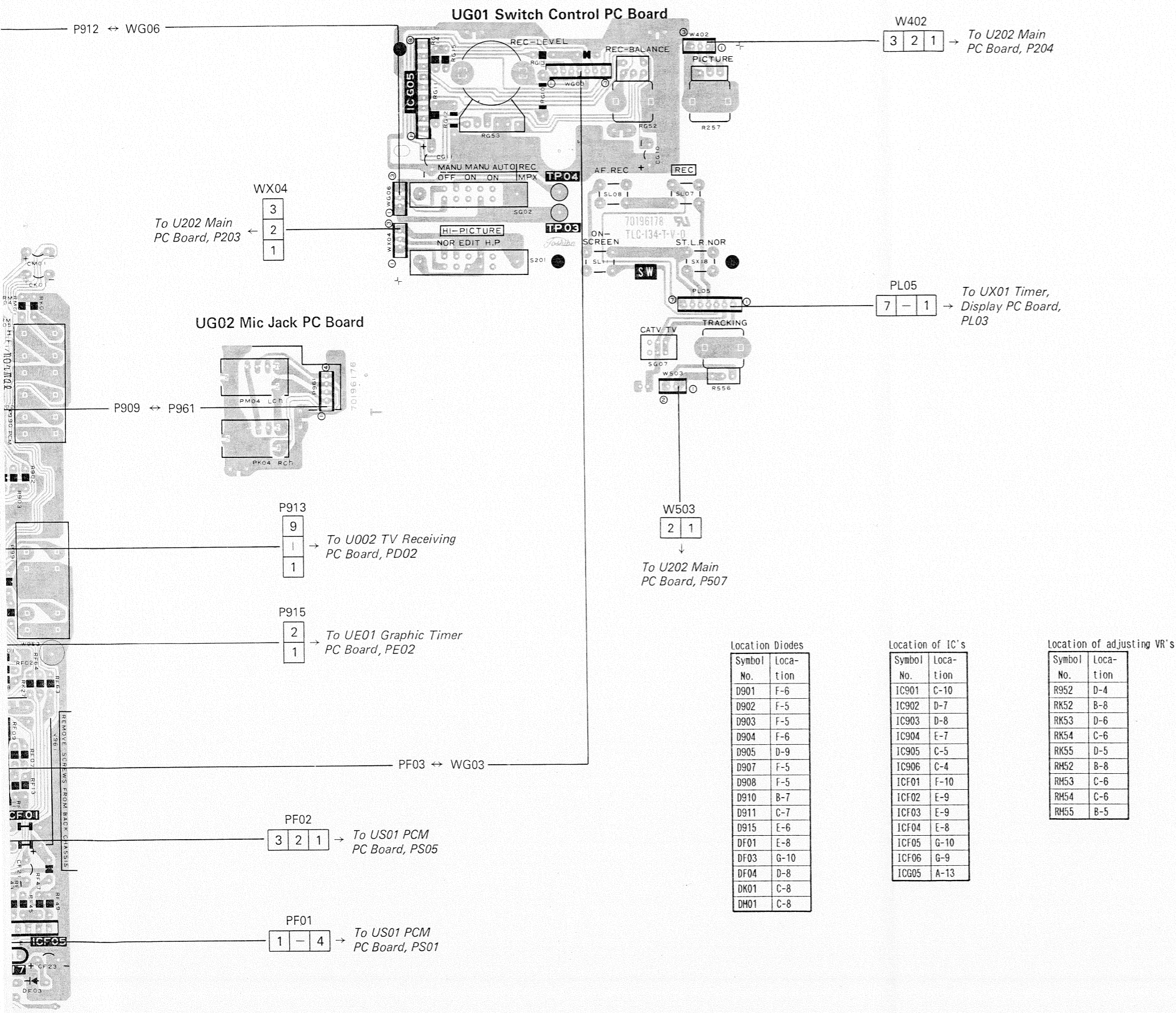


15-2. Hi-Fi Audio PC Board



U902 Hi-Fi Audio PC Board





V : REC (V): PLAY

Symbol No.	Voltage(Unit:V)			Location
	E	C	B	
Q908	0 (0)	2.4 (2.4)	0 (0)	D-9
Q910	0 (0)	0 (2.7)	4.9 (0)	E-6
Q911	0.2 (0.2)	5.0 (5.0)	0.7 (0.7)	F-6
Q912	6.4 (6.4)	0 (0)	6.4 (6.4)	F-6
Q913	0 (0)	0 (0)	0 (0)	F-6
Q914	0 (0)	6.4 (6.4)	0 (0)	F-5
Q915	0 (0)	0 (0)	0 (0)	F-5
Q916	7.5 (7.5)	8.2 (8.2)	8.2 (8.2)	F-7
Q922	0 (1.3)	0 (0)	0 (0.7)	E-5
Q923	0 (1.3)	0 (1.3)	0 (0)	D-5
Q924	3.3 (0)	0 (0)	2.7 (0)	E-4
Q925	0 (0)	0 (0)	2.6 (0.4)	E-4
Q926	0 (6.5)	0 (8.1)	0 (7.2)	F-4
Q927	-6.7 (-6.7)	-6.1 (-6.1)	3.4 (3.4)	E-6
Q928	-5.0 (-5.0)	-12.6 (-12.6)	-5.6 (-5.6)	E-6
Q929	4.1 (4.1)	5.0 (5.0)	4.8 (4.8)	B-8
Q930	3.5 (4.1)	-2.3 (-5.0)	2.9 (3.9)	B-7
Q931	1.1 (0.5)	2.9 (3.9)	1.8 (0.9)	D-5
Q932	0 (0)	0 (0.5)	4.9 (0)	D-5
Q933	0 (0)	0 (0)	0 (0)	C-8
Q934	0 (0)	4.7 (0)	0 (0)	C-8
Q935	4.7 (0)	4.8 (4.8)	4.9 (0)	B-7
Q936	0 (0)	1.9 (1.9)	0 (0)	B-5
Q937	0 (0)	5.0 (5.0)	0 (0)	D-8
QK01	0 (0)	0 (0)	0 (2.7)	B-6
QK02	0 (0)	0 (0)	0 (2.7)	B-6
QK03	0 (0)	0 (0)	0 (0)	F-6
QK05	3.3 (3.3)	7.8 (7.8)	3.9 (3.9)	F-8
QK06	0 (0)	0 (0)	-0.7 (-0.7)	C-8
QK07	0 (0)	0 (0)	0 (0)	D-5
QK08	8.4 (8.4)	-2.2 (-2.2)	7.8 (7.8)	F-8
QK09	5.0 (5.0)	0 (0)	5.0 (5.0)	D-8
QM01	0 (0)	0 (0)	0 (0)	E-6
QM02	0 (0)	0 (0)	0 (0)	E-6
QM03	0 (0)	0 (0)	0 (0)	F-6
QM05	3.3 (3.3)	7.8 (7.8)	3.9 (3.9)	E-8
QM06	0 (0)	0 (0)	-0.7 (-0.7)	C-8
QM07	0 (0)	0 (0)	0 (0)	B-5
QM08	8.4 (8.4)	-2.2 (-2.2)	7.8 (7.8)	F-8
QM09	5.0 (5.0)	0 (0)	5.0 (5.0)	D-8
QF11	0 (0)	0 (0)	0 (0)	F-9
QF12	0 (0)	8.9 (8.9)	0 (0)	F-9
QF13	0 (0)	0 (0)	0 (0)	E-8
QF14	0 (0)	8.9 (8.9)	0 (0)	F-9
QF15	0 (0)	8.9 (8.9)	0 (0)	E-9
QF16	0 (0)	0 (0)	0 (0)	G-10
QF17	0 (0)	8.9 (8.9)	0 (0)	G-10
QF19	0 (0)	0 (0)	0 (0)	G-8
QF20	0 (0)	0 (0)	0 (0)	G-8
QF21	0 (0)	0 (0)	0 (0)	F-8
QF22	0 (0)	0 (0)	0 (0)	D-9
QF23	0 (0)	1.5 (1.5)	0 (0)	C-7
QF24	5.0 (5.0)	5.0 (5.0)	0 (0)	C-7

Voltage values in the table above are measured under the condition as follows.

- Input selector SW: TV
- Rec level/MPX SW: AUTO/ON
- Audio selector SW: STEREO
- Level meter select SW: LEVEL
- PCM selector SW: Hi-Fi
- PCM selector SW: VCR

15-3. Hi-Fi Audio Data

1) CONTROL TERMINAL VOLTAGE OF INPUT SELECTOR IC, IC901 (TA8626N)

Unit: V

IC PIN NO. INPUT SELECTOR MODES	PIN ②	PIN ⑩	PIN ⑪
TV	0.5	2.3	0.0[4.0]
SIMUL	2.3	2.3	0.0[4.0]
LINE	5.1	2.3	0.0[4.0]

[] : MIC MODE

6) AUDIO SELECT SW AND IC902 OUTPUT L/R SELECTOR VOLTAGE

Unit: V

AUDIO SELECT SW	STEREO	L	R	NORMAL
OUTPUT	L	○	○	×
DISPLAY*	R	○	×	×
IC902 CONTROL VOLTAGE	PIN ②	0.0	5.0	0.0
	PIN ⑪	0.0	0.0	5.0

*: L/R DISPLAY OF LEVEL METER LEFT SIDE

(○: ON, ×: OFF)

2) AUTO/MANUAL SELECTOR TRANSISTOR VOLTAGE

Unit: V

SW POSITION	AUTO			MANUAL		
TERMINAL	E	C	B	E	C	B
SYMBOL NO.						
QF14	0.0	8.9	0.0	0.0	0.0	2.9
QF23	0.0	1.5	0.0	0.0	0.0	2.9

7) TRANSISTOR VOLTAGE OF FORCED NORMAL OUTPUT SELECTOR

Unit: V

MODE	REC. EE			PLAY					
USED TAPE				Hi-Fi REC TAPE			NORMAL REC TAPE		
TERMINAL	E	C	B	E	C	B	E	C	B
SYMBOL NO.									
Q937	0.0	5.0	0.0	0.0	5.0	0.0	0	0	3.8
QK09	5.0	*	5.0	5.0	*	5.0	5.0	5.0	0
QM09	5.0	*	5.0	5.0	*	5.0	5.0	5.0	0

*: Voltage changes depending on L/R selector voltage (P901③, ④).

3) CONTROL TERMINAL VOLTAGE OF L/R SELECTOR IC, IC902 (TA8627N)

Unit: V

IC PIN NO. SW POSITION	PIN ②	PIN ⑪
STEREO	0.2	0.0
L	0.2	5.0
R	5.0	0.0
NORMAL	5.0	5.0

8) Hi-Fi DISPLAY TRANSISTOR VOLTAGE

Unit: V

MODE	REC. EE			Hi-Fi TAPE PLAY						NORMAL TAPE PLAY		
AUDIO SELECT SW	Don't care.			STEREO, L, R			NORMAL			<FORCED> NORMAL		
TERMINAL	E	C	B	E	C	B	E	C	B	E	C	B
SYMBOL NO.												
Q935	*	4.8	0.0	4.7	4.8	4.9	0.1	0.1	4.9	0.1	0.1	4.9
Q929	4.1	5.0	4.8	4.1	5.0	4.8	0.0	5.0	0.1	0.0	5.0	0.1
Q933, Q934	ON/OFF depending on L/R selector voltage (P901, ③, ④).											

*: Voltage changes depending on ON/OFF of Q933 and Q934.

4) CONTROL TRANSISTOR VOLTAGE OF INPUT SELECTOR IC, IC901

Unit: V

INPUT SELECTOR SW	TV, S.C			LINE		
TERMINAL	E	C	B	E	C	B
SYMBOL NO.						
Q908	0.0	2.4	0.0	0.0	2.4	0.0

9) CONTROL TERMINAL VOLTAGE OF MIX SELECTOR IC, IC902 (TA8672N)

Unit: V

IC PIN NO. MIX SELECTOR SW	PIN ②
Hi-Fi	4.9
MIX	0.6

5) TRANSISTOR VOLTAGE OF MPX FILTER SELECTOR

Unit: V

MODE	REC. EE			PLAY					
MPX FILTER SW	ON			OFF			Don't care.		
TERMINAL	E	C	B	E	C	B	E	C	B
SYMBOL NO.									
QK01, QM01	0.0	0.0	2.7	0.0	0.0	0.0	0.0	0.0	0.0
QK02, QK02									

10) CONTROL TERMINAL VOLTAGE OF MIC SELECTOR IC, IC901 (TA8626N)

Unit: V

IC PIN NO. MIC MODE	PIN ②
OFF	0.0
ON	4.1

11) MIC SELECTOR TRANSISTOR VOLTAGE

Unit: V

MIC MODE SYMBOL NO.	OFF			ON		
	B	C	E	B	C	E
QF11	0.0	0.0	0.0	4.1	0.0	0.0
QF22	0.0	0.0	0.0	4.1	0.0	0.0

12) CONTROL VOLTAGE OF HI-FI MODE SELECTOR IC, ICF03 (TC4053BP)

Unit: V

IC PIN NO. DIGITAL GRAPHIC TIMER MODE	PIN ⑩
OFF	8.9
ON	0.0

Unit: V

IC PIN NO.	PIN ⑨	
PCM SELECTOR SW	VCR	PCH
	AUTO/MANUAL SELECTOR SW	
AUTOMATIC	8.9	8.9
MANUAL	0.0	8.9

13) CONTROL TERMINAL VOLTAGE OF INPUT SELECTOR IC, ICF01, ICF02

Unit: V

PCM SW	VCR		PCH	
MIC MODE	OFF	ON	OFF	ON
PIN ① CONTROL VOLTAGE	8.9	8.9	6.1	8.9

14) PCM SELECTOR TRANSISTOR VOLTAGE

Unit: V

PCM SW	VCR			PCH		
TERMINAL SYMBOL NO.	E	C	B	E	C	B
QF12	0.0	8.9	0.0	0.0	0.0	2.8
QF13	0.0	0.0	0.0	0.0	0.0	5.0
QF17	0.0	8.9	0.0	0.0	0.0	2.4

15) CONTROL TERMINAL VOLTAGE OF OUTPUT SELECTOR IC, ICF05, ICF06

Unit: V

PCM SELECTOR SW	VCR		PCH	
DIGITAL GRAPHIC TIMER MODE	OFF	ON	OFF	ON
PIN ① CONTROL VOLTAGE	8.9	8.9	6.1	8.9

16) DIGITAL GRAPHIC TIMER SELECTOR TRANSISTOR VOLTAGE

Unit: V

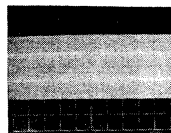
DIGITAL GRAPHIC TIMER MODE	OFF			ON		
TERMINAL SYMBOL NO.	E	C	B	E	C	B
QF15	0.0	8.9	0.0	0.0	0.0	4.2
QF16	0.0	0.0	0.0	0.0	0.0	4.2

17) Voltage values in the circuit diagrams are measured under the conditions as follows.

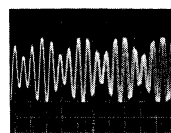
- Input selector SW : TV
Rec level/HPX SW : AUTO/ON
Audio select SW : STEREO
Level meter select SW: LEVEL
PCM selector SW : VCR
- Hi-Fi recorded tape is used for playback.

Record Mode

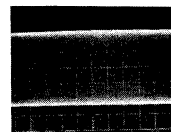
① TP901 F-6


V: 0.1V/div.
H: 5ms/div.

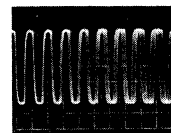
① TP901 F-6


V: 0.1V/div.
H: 1μs/div.

② TPK01 F-9


V: 0.5V/div.
H: 0.5ms/div.

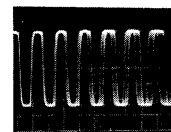
② TPK01 F-9


V: 0.5V/div.
H: 0.5μs/div.

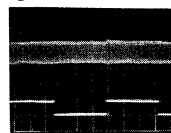
③ TPM01 F-7


V: 0.5V/div.
H: 0.5ms/div.

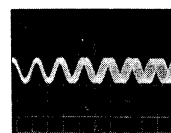
③ TPM01 F-7

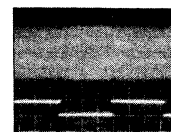

V: 0.5V/div.
H: 0.5μs/div.

Playback Mode

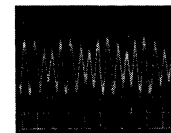
④a IC905, Pin ⑩ G-7
④b TP902 E-7

a V: 50mV/div.
H: 5ms/div.
b V: 5V/div.
H: 5ms/div.

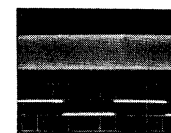
④a IC905, Pin ⑩ G-7


V: 50mV/div.
H: 0.5μs/div.

⑤a TP903 E-6
⑤b TP902 E-7

a V: 0.1V/div.
H: 5ms/div.
b V: 5V/div.
H: 5ms/div.

⑤a TP903 E-6


V: 0.1V/div.
H: 1μs/div.

⑥a IC905, Pin ⑫ G-9
⑥b TP902 E-7

a V: 50mV/div.
H: 5ms/div.
b V: 5V/div.
H: 5ms/div.

⑥a IC905, Pin ⑫ G-9


V: 50mV/div.
H: 0.5μs/div.

15-4. Hi-Fi Audio Circuit

A

B

C

D

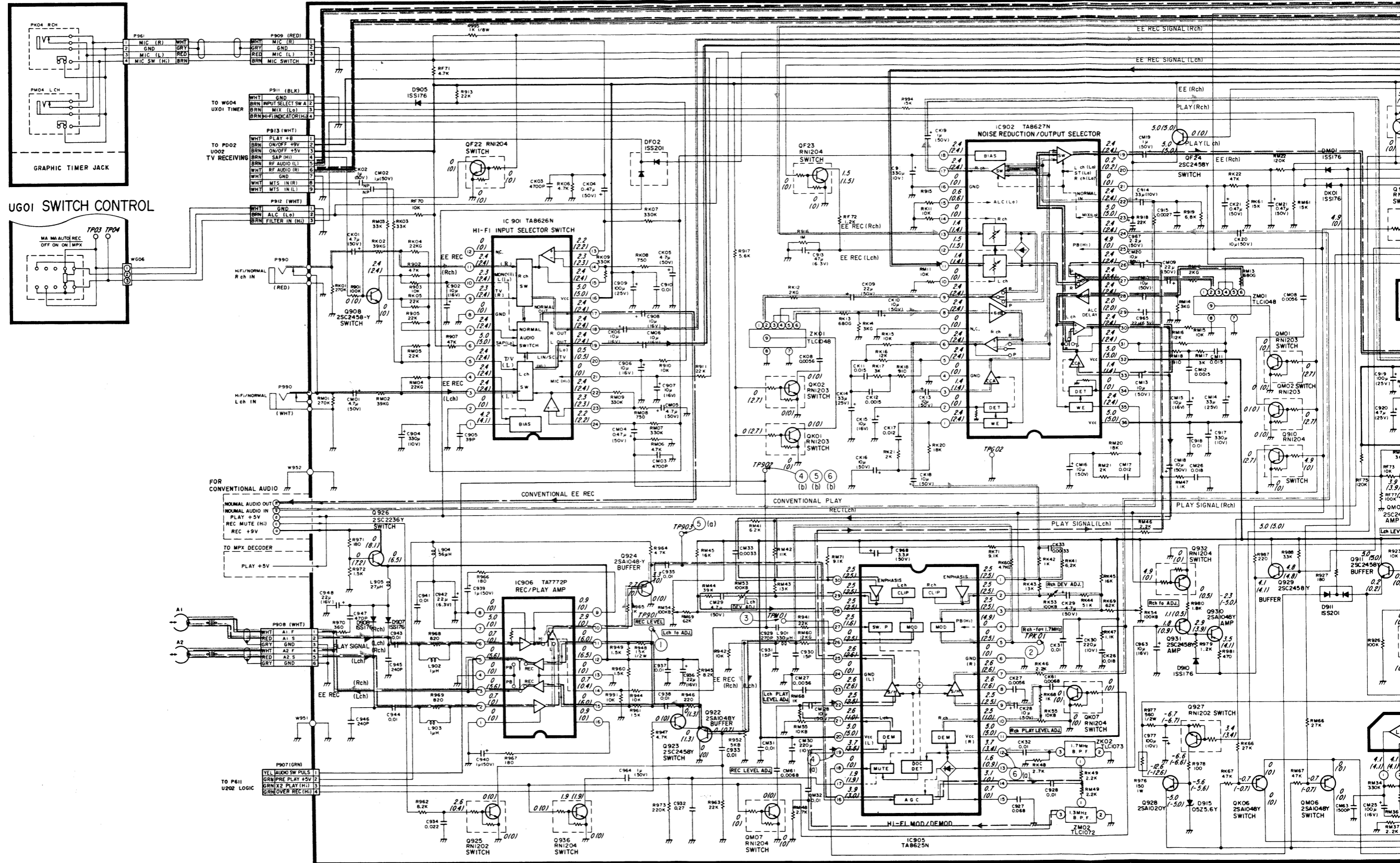
E

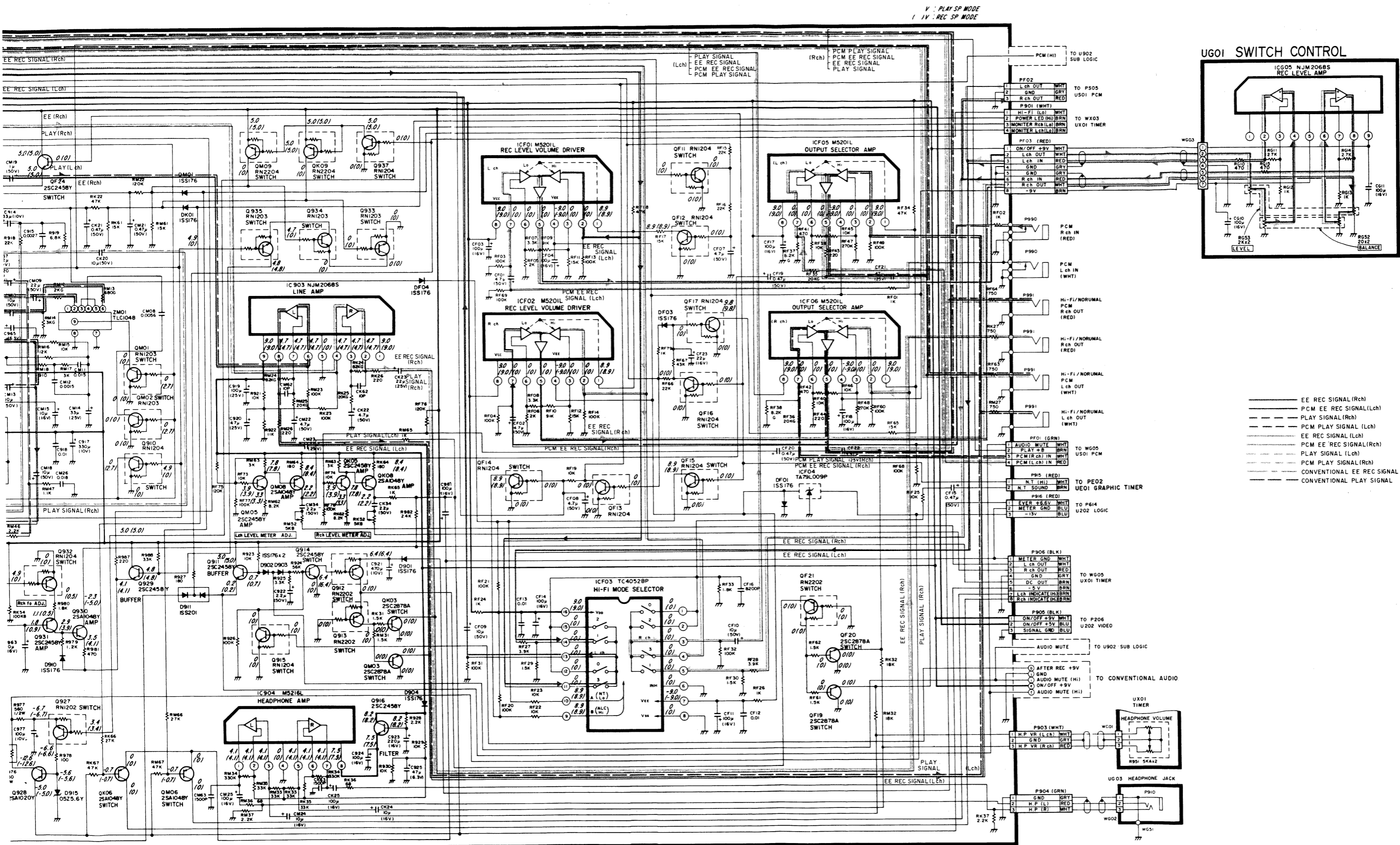
F

G

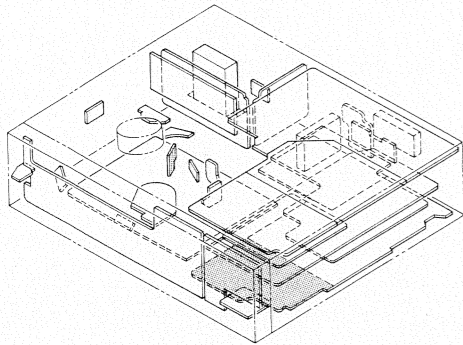
UG02 MIC JACK

U902 Hi-Fi AUDIO





15-5. Conventional Audio PC Board



V: PLAY
(V): REC

Symbol No.	Voltage(Unit:V)			Location
	E	C	B	
Q704	0.0 (0.0)	0.0 (6.2)	0.7 (0.0)	E-7
Q705	0.0 (0.2)	0.0 (9.9)	0.0 (0.5)	D-5
Q706	0.0 (0.7)	0.0 (0.1)	0.0 (0.7)	D-6
Q707	0.0 (0.0)	8.9 (0.0)	0.0 (0.6)	E-7
Q708	0.0 (0.0)	0.0 (0.0)	0.0 (0.7)	C-5
Q709	0.0 (0.0)	0.7 (0.0)	0.0 (0.0)	E-8
Q710	4.5 (4.5)	4.3 (4.5)	0.0 (5.2)	D-6
Q711	0.0 (0.0)	3.9 (3.9)	0.6 (0.6)	D-7
Q712	0.0 (0.0)	6.5 (0.0)	0.0 (4.2)	D-6
Q713	0.0 (0.0)	0.0 (4.7)	4.5 (0.0)	C-6

Location of Diodes

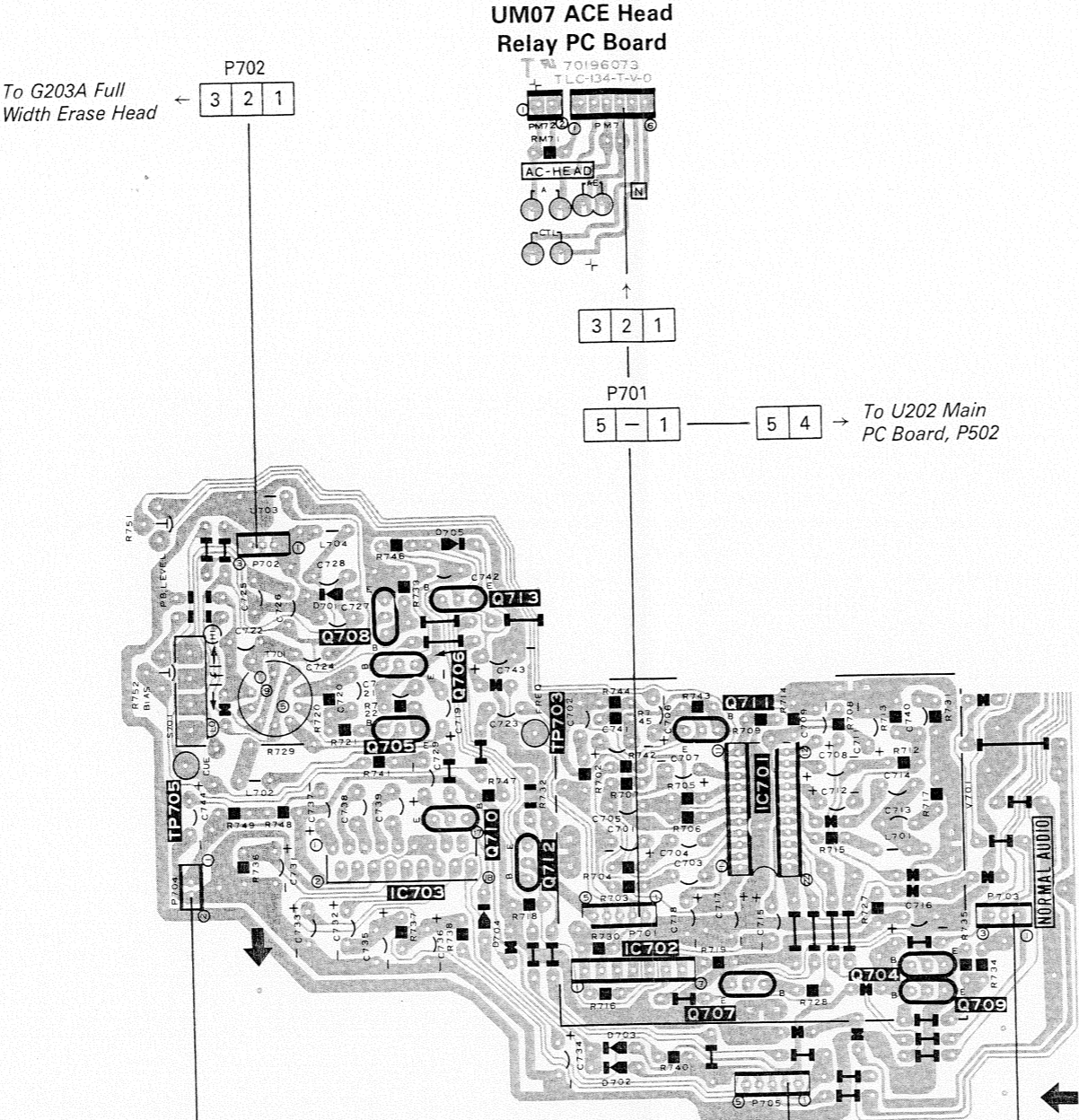
Symbol No.	Location
D701	C-5
D702	E-6
D703	E-6
D704	E-6
D705	C-6

Location of IC's

Symbol No.	Location
IC701	D-7
IC702	E-6
IC703	E-5

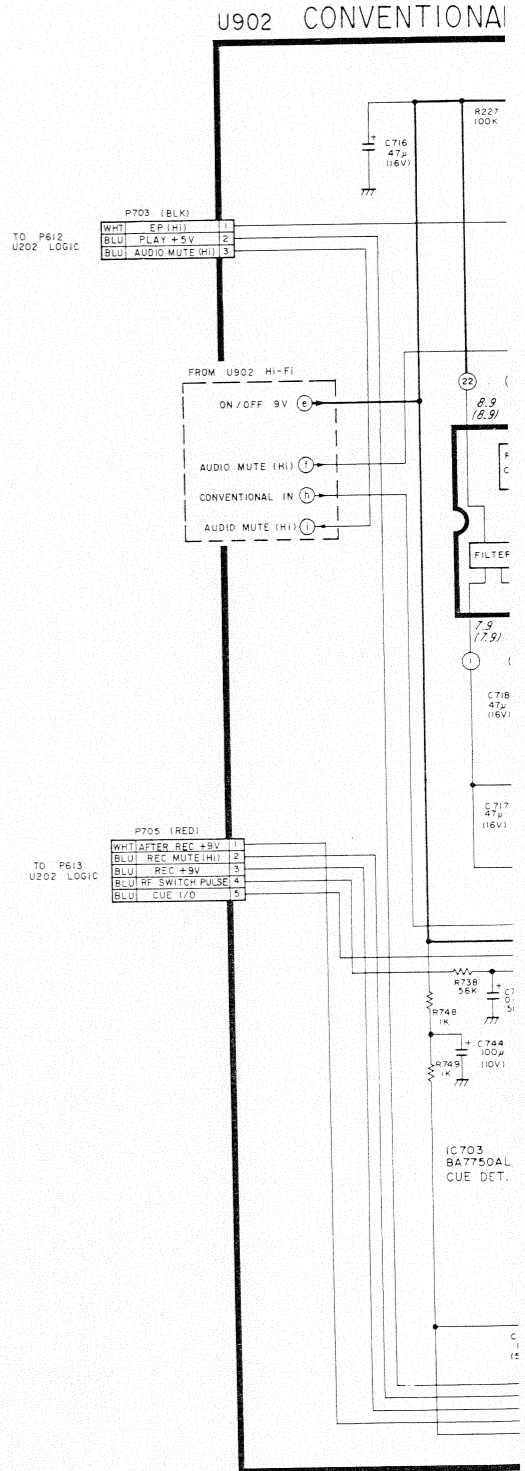
Location of adjusting VR's

Symbol No.	Location
R751	C-4
R752	D-4



U902 Conventional Audio PC Board

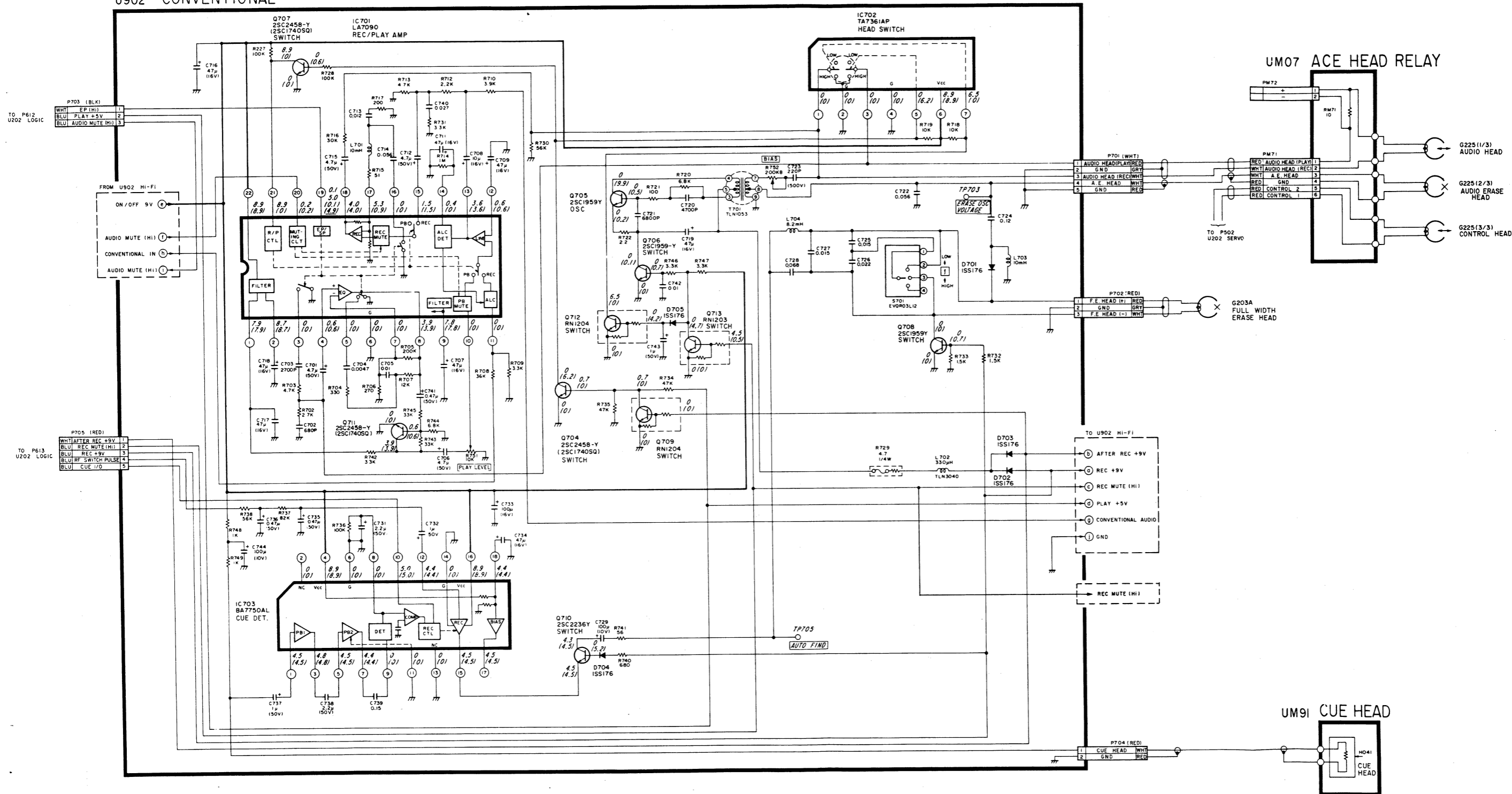
15-6. Conventional Audio Circuit



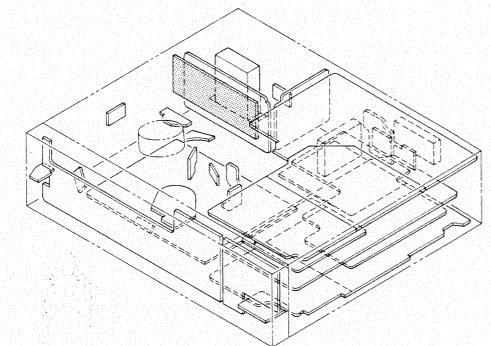
Conventional Audio Circuit

U902 CONVENTIONAL

V: PLAY SP MODE
 V: PLAY EP MODE
 V: REC SP MODE
 V: REC EP MODE



16-1. Pre Amp PC Board



V : SP

(V): EP

Voltage and Location of Transistors

Symbol No.	Voltage(Unit:V)						Location
	E		C		B		
	PLAY	REC	PLAY	REC	PLAY	REC	
QV03	3.6 (4.9)	1.0	0	0	2.9 (4.2)	0.3	E-3
QV04	4.9 (3.6)	1.0	0	0	4.2 (2.9)	0.3	E-4
QV05	0	0	—	—	—	—	D-4

Location of Diodes

Symbol No.	Location
DV01	E-4
DV02	E-4
DV03	E-5
DV04	E-5
DV05	E-3

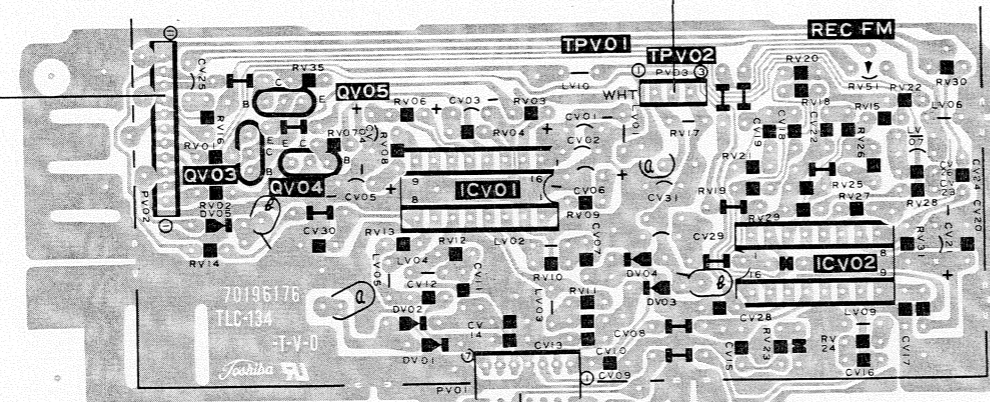
Location of IC's

Symbol No.	Location
ICV01	E-4
ICV02	E-6

Location of adjusting VR

Symbol No.	Location
RV51	D-6

UV01 Pre Amp PC Board

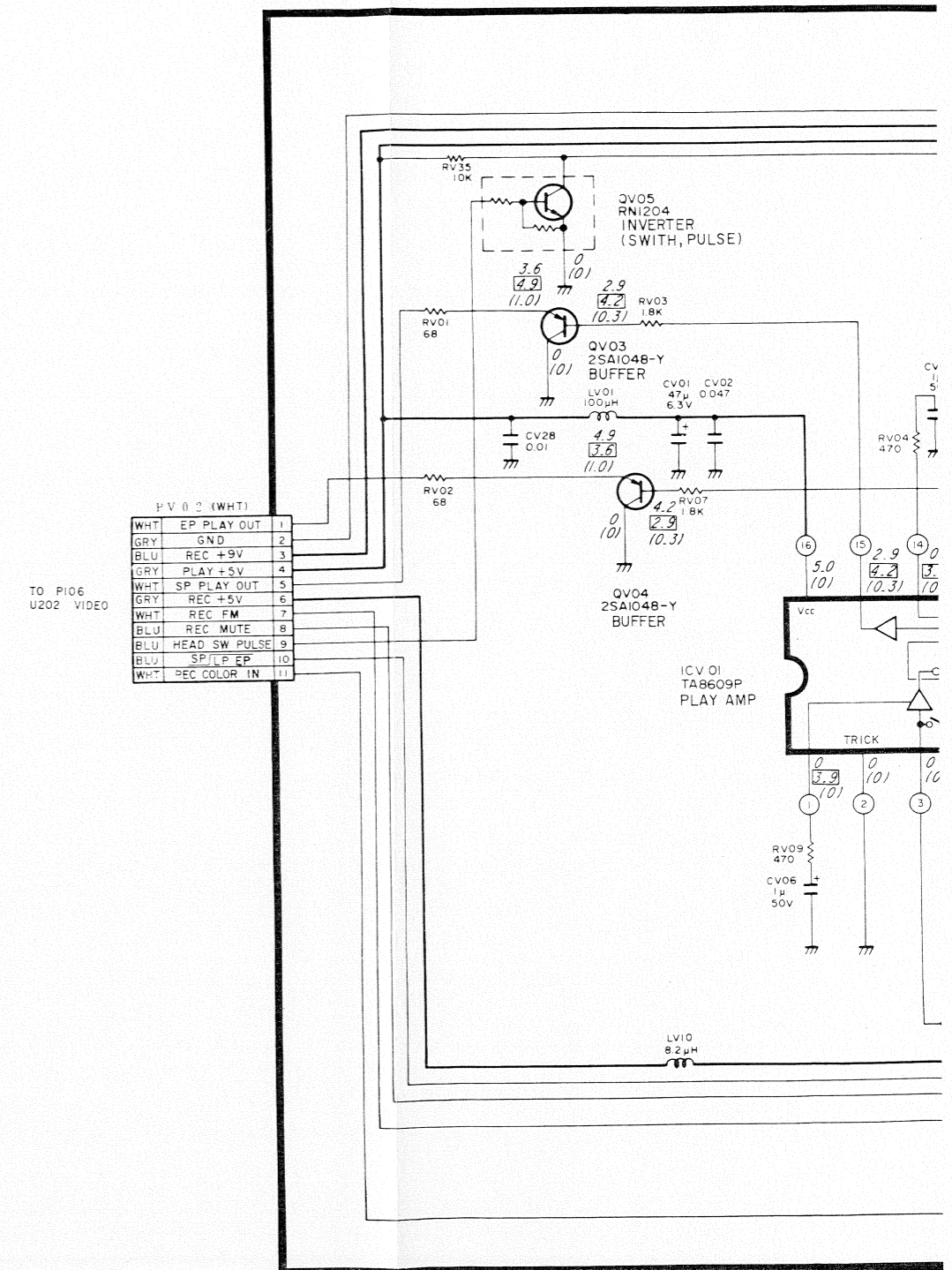


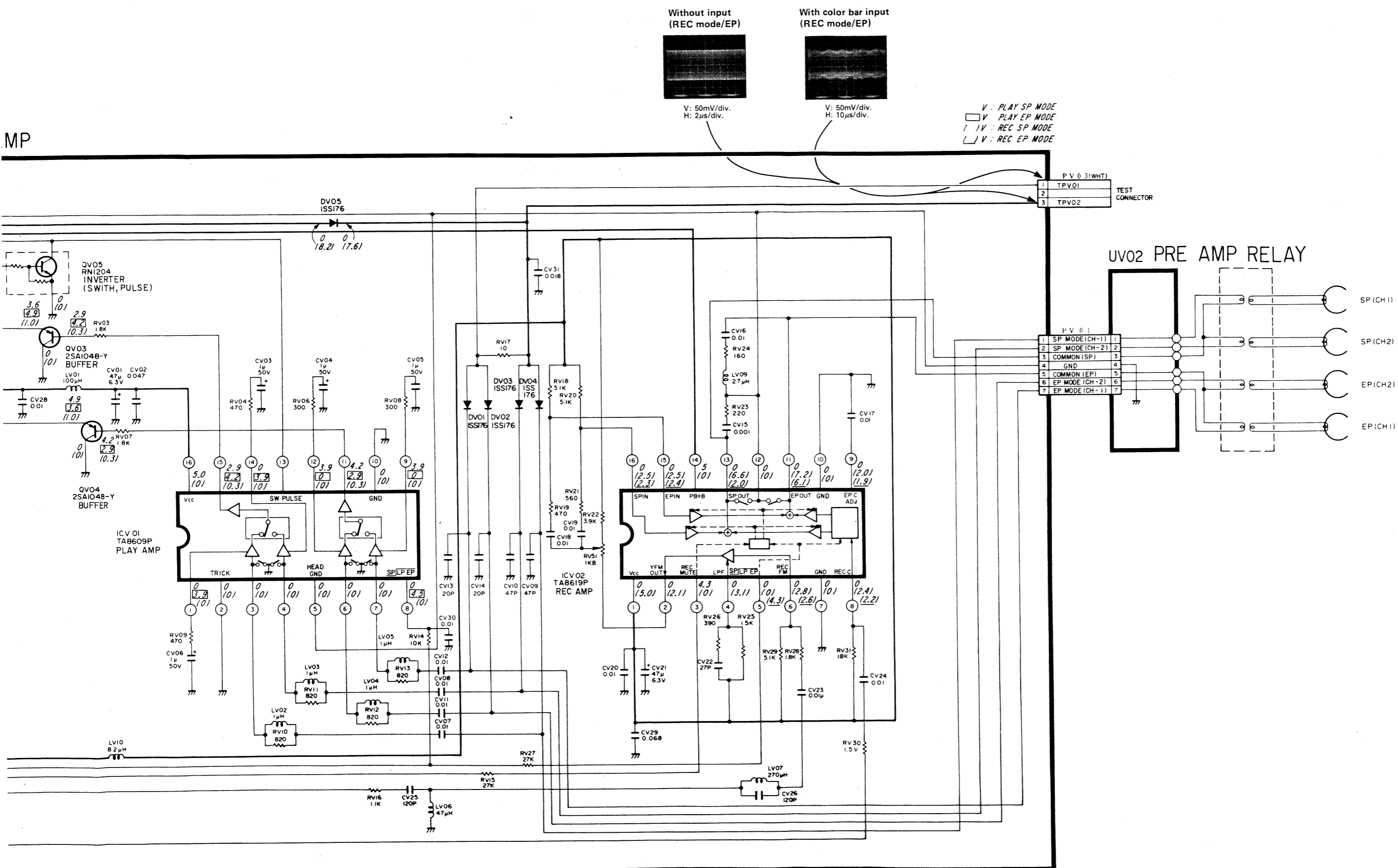
To U202 Main PC Board, P106

PV01
7 - 1 → To Head Relay PC Board

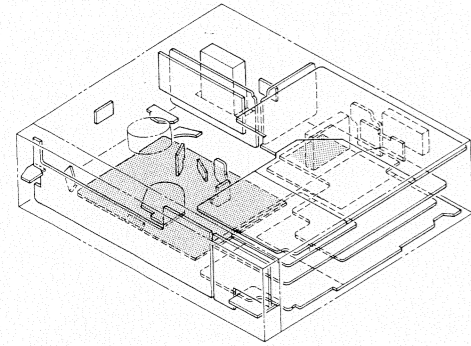
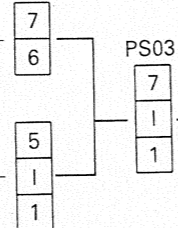
16-2. Pre Amp Circuit

UV01 PRE AMP

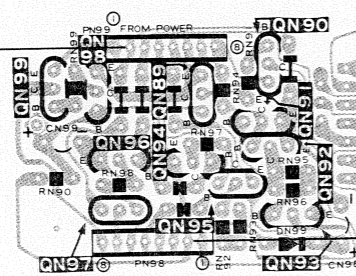




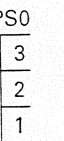
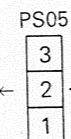
17-3. PCM PC Board

US01 PCM PC Board
(Bottom View)To U202 Main
PC Board, P311To U202 Main
PC Board, P310

U002 PCM Power Switch PC Board

To U803 Power 2
PC Board, P807

PN98 ↔ PS02

To U902 Hi-Fi
Audio PC Board, ←
PF02To U9
Audio
PF01

V : REC
Voltage and Location of Transistors (V): PLAY

Symbol No.	Voltage(Unit:V)			Location
	E	C	B	
QN16	1.5 (0.9)	4.8 (0.9)	0.0 (1.5)	B-3
QN17	4.8 (4.8)	0 (4.8)	4.8 (0.9)	B-3
QN18	1.5 (0.9)	4.8 (4.8)	2.1 (1.5)	B-3
QN19	0 (0)	2.1 (0.0)	0 (4.8)	B-3
QN20	0 (0)	0 (4.4)	0 (0)	B-3
QN21	0 (0)	2.3 (4.3)	0 (0)	B-4
QN22	0 (0)	0.0 (4.4)	0 (0)	B-4
QN25	7.2 (7.2)	0.0 (5.4)	6.6 (6.6)	C-4
QN26	7.2 (7.2)	5.4 (5.4)	6.6 (6.6)	D-4
QN27	5.4 (5.4)	2.0 (2.0)	4.8 (4.8)	C-4
QN28	0 (0)	0 (2.3)	3.7 (0.1)	C-4
QN30	1.4 (1.4)	7.0 (7.0)	2.0 (2.0)	B-7
QN31	2.0 (2.0)	4.5 (4.5)	2.7 (2.7)	B-7
QN32	1.6 (1.6)	0.0 (0.0)	1.6 (1.6)	A-6
QN33	1.6 (1.6)	8.6 (8.6)	2.3 (2.3)	B-7
QN34	1.2 (1.1)	4.8 (4.8)	1.7 (1.6)	A-5
QN35	2.4 (2.3)	0.0 (0.0)	1.7 (1.7)	A-6
QN36	1.7 (1.7)	8.8 (8.8)	1.6 (1.6)	A-6
QN37	2.1 (2.5)	4.8 (4.8)	2.8 (3.3)	A-5
QN38	2.4 (2.4)	8.6 (8.8)	2.8 (2.8)	B-7
QN39	0.0 (0.0)	4.7 (4.7)	0.0 (0.0)	C-4
QN89	0 (0)	0.1 (0.1)	2.1 (2.1)	D-9
QN90	6.5 (6.5)	6.4 (6.4)	5.9 (5.9)	D-9
QN91	4.9 (4.9)	2.3 (2.3)	4.9 (4.9)	D-9
QN92	4.9 (4.9)	4.8 (4.8)	2.3 (2.3)	D-9
QN93	-13.0 (-13.0)	-12.9 (-12.9)	-12.2 (-12.2)	D-9
QN94	0 (0)	0.1 (0.1)	2.1 (2.1)	D-9
QN95	4.9 (4.9)	4.9 (4.9)	0.1 (0.1)	D-9
QN96	0 (0)	0.2 (0.2)	2.1 (2.1)	D-10
QN97	4.9 (4.9)	4.9 (4.9)	0.2 (0.2)	D-10
QN98	0 (0)	0.1 (0.1)	2.1 (2.1)	D-10
QN99	8.9 (8.9)	8.8 (8.8)	0.1 (0.1)	D-10
QS15	5.0 (5.0)	6.4 (6.4)	5.7 (5.7)	D-7
QS16	0 (0)	0 (8.5)	4.7 (0)	G-6
	G	S	D	
QS17	0.6 (0.6)	0 (0)	0 (0)	G-5
QS18	0.6 (0.6)	0 (0)	0 (0)	F-5
	E	C	B	
QS19	4.9 (4.9)	4.9 (4.9)	2.1 (4.9)	G-4
QS20	4.9 (4.9)	4.9 (4.9)	4.1 (0.9)	G-4

V : REC
Voltage and Location of IC's (V): PLAY

Symbol No.	Voltage(Unit:V)			Location
	①	②	③	
ICS10	0 (0)	-10.2 (-10.2)	-12.1 (-12.1)	G-3
ICS11	-9.1 (-9.1)	0 (0)	-12.0 (-12.0)	C-5
ICS12	0 (0)	-5.1 (-5.1)	-7.5 (-7.5)	D-5
ICS13	-5.0 (-5.0)	0 (0)	-9.0 (-9.0)	E-5
ICS14	4.9 (4.9)	8.6 (8.6)	0 (0)	E-4
ICS21	-9.0 (-9.0)	0 (0)	-12.9 (-12.9)	C-5

Location of IC's


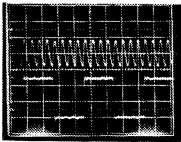
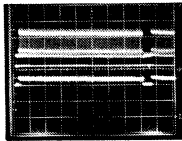
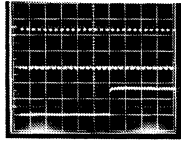
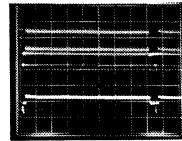
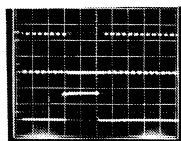
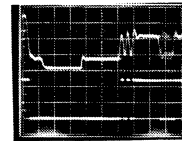
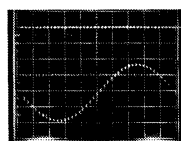
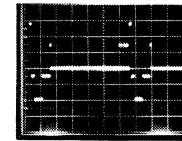
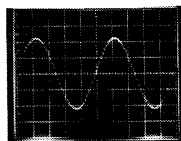
Symbol No.	Location
ICN01	A-3
ICN02	A-4
ICN03	A-4
ICN04	A-4
ICN05	C-4
ICN06	C-5
ICN07	D-3
ICN08	D-3
ICN09	C-4
ICN10	C-5
ICN11	A-5
ICN12	B-6
ICN13	B-5
ICN14	B-6
ICS01	G-6
ICS02	E-5
ICS03	F-3
ICS04	D-6
ICS05	E-7
ICS06	F-6
ICS07	F-4
ICS08	D-3
ICS09	D-4

Location of Diodes

Symbol No.	Location
DN01	B-3
DN03	B-5
DN99	D-9
DS01	G-3
DS02	C-6
DS03	D-5
DS04	D-4
DS05	E-3
DS06	D-7
DS07	G-4
DS08	F-6
DS09	F-6

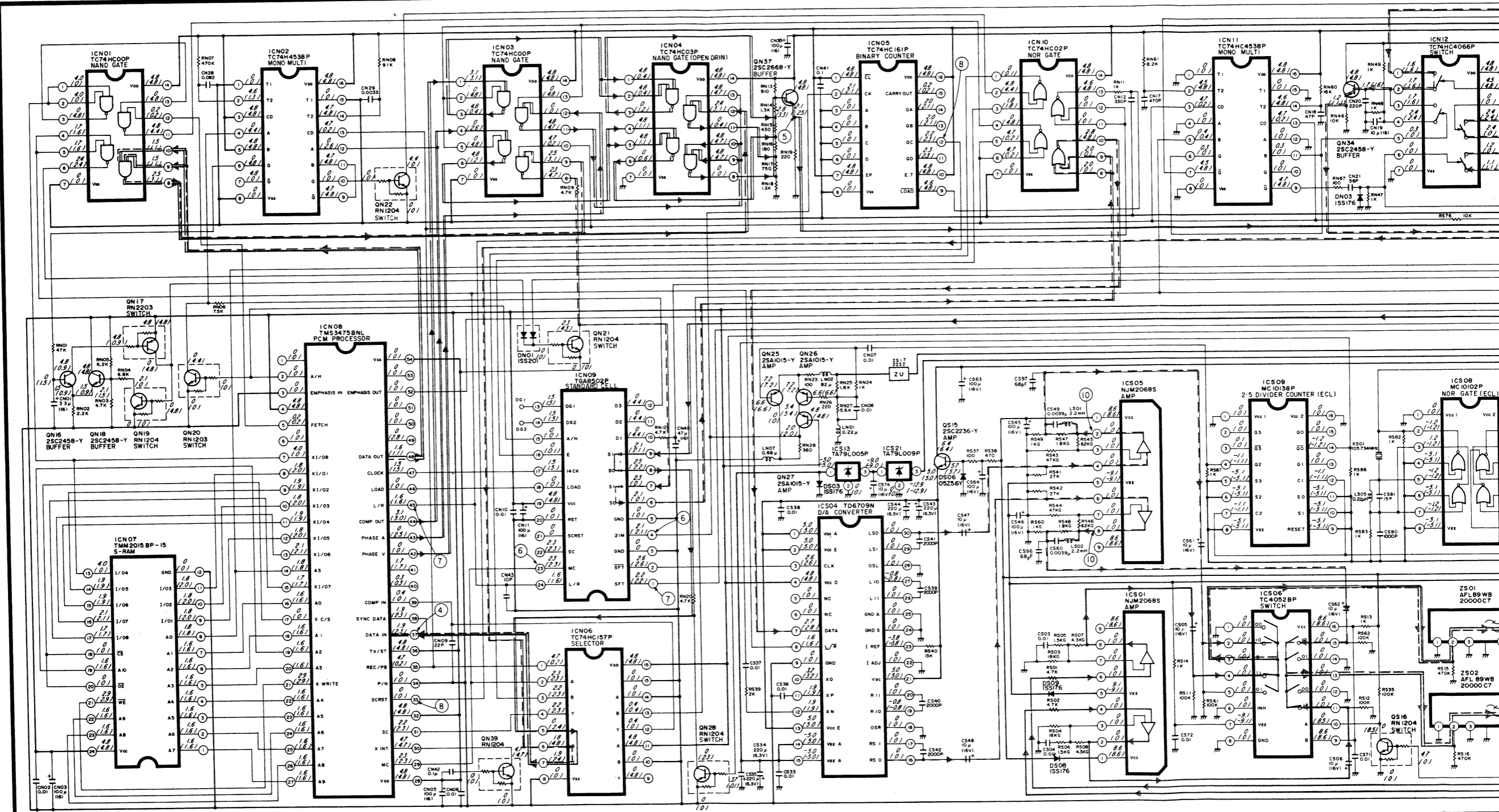
Location of adjusting VR's

Symbol No.	Location
RS51	F-4
RS52	E-4
RS53	F-4

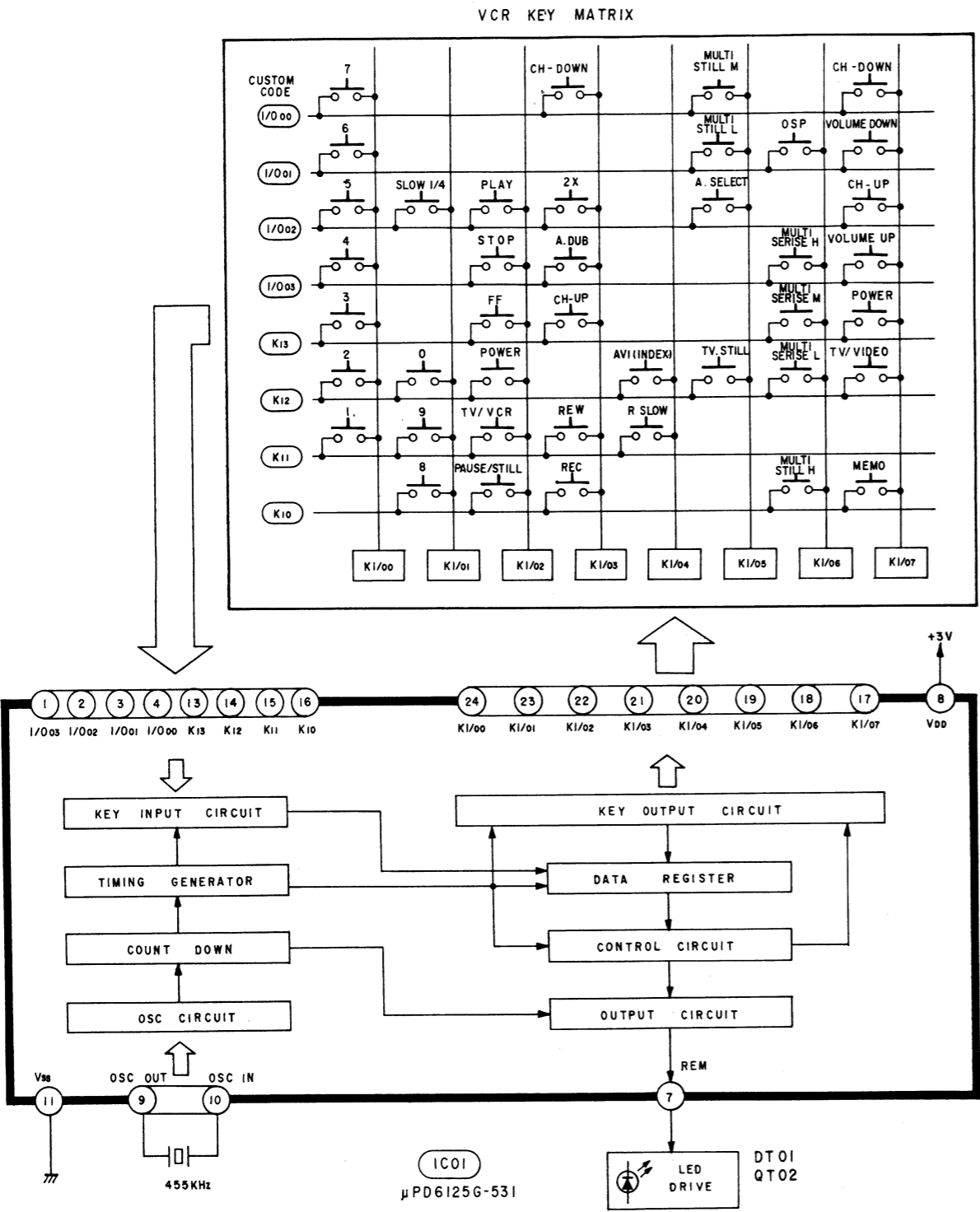
<p>① QN33, Emitter (Play) C-15</p>  <p>V: 0.5V/div. H: 2μs/div.</p>	<p>⑥a ICN09, Pin ④ E-6 ⑥b ICN09, Pin ②③ E-5</p>  <p>V: 2V/div. H: 0.1μs/div.</p>
<p>②a QN33, Emitter C-15 ②b ICN14, Pin ① (Play) B-13</p>  <p>V: 1V/div. H: 2ms/div.</p>	<p>⑦a ICN09, Pin ① F-6 ⑦b ICN08, Pin ④⑤ E-4</p>  <p>V: 2V/div. H: 2μs/div.</p>
<p>③a QN33, Emitter C-15 ③b ICN14, Pin ⑦ (Play) B-14</p>  <p>V: 1V/div. H: 2ms/div.</p>	<p>⑧a ICN05, Pin ⑫ B-8 ⑧b ICN08, Pin ③③ (Play) F-4</p>  <p>V: 2V/div. H: 10μs/div.</p>
<p>④a QN33, Emitter C-15 ④b ICN08, Pin ③⑦ (Play) F-4</p>  <p>V: 1V/div. H: 10μs/div.</p>	<p>⑨ TPS01/TPS02 E-15/G-15</p>  <p>V: 1V/div. H: 0.1ms/div.</p>
<p>⑤ QN37, Emitter (STOP) B-7</p>  <p>V: 0.2V/div. H: 10μs/div.</p>	<p>⑩ ICS05, Pin ②, ⑧ D-9, E-9</p>  <p>V: 1V/div. H: 0.2ms/div.</p>

17-4. PCM Circuit

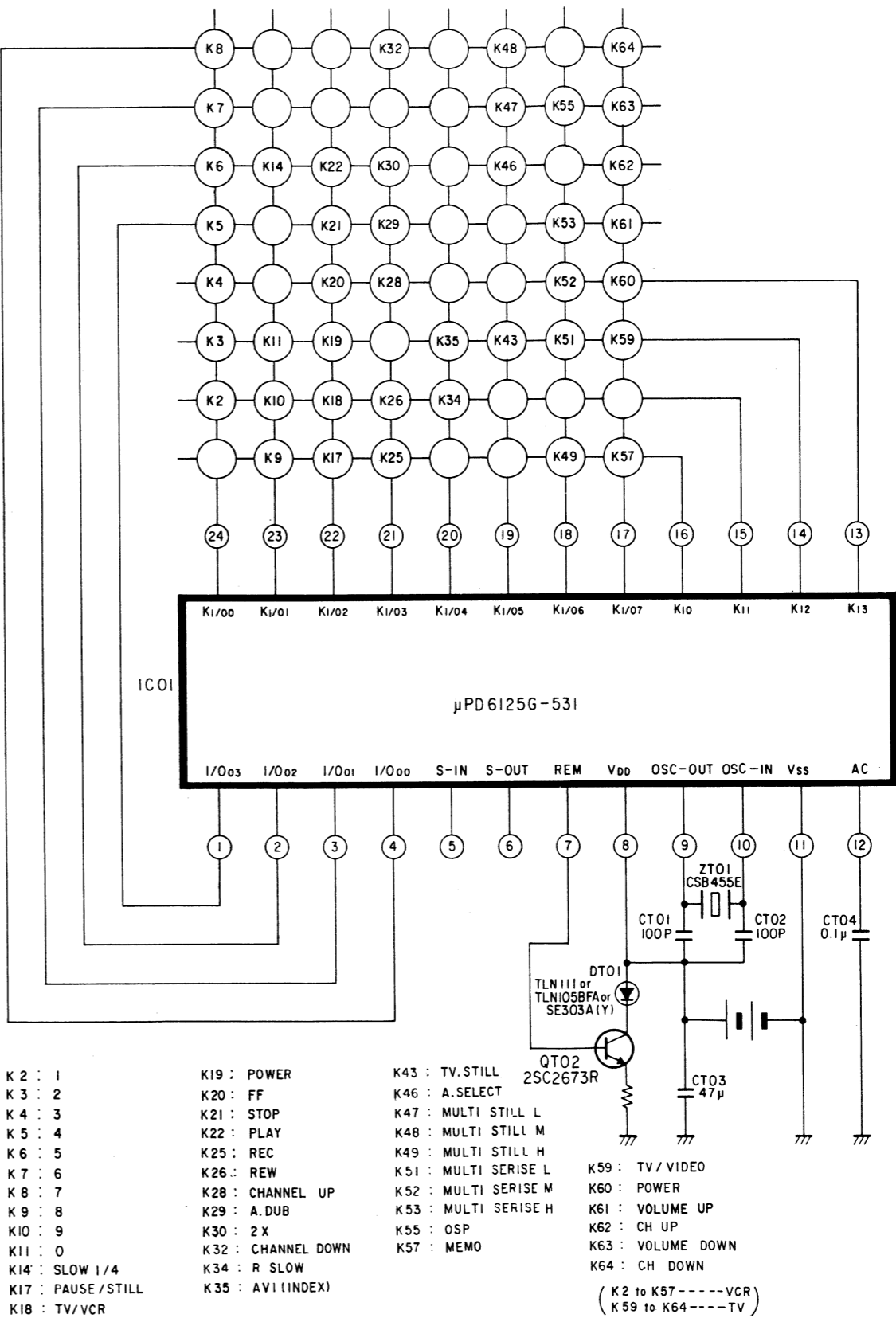
US01 PCM



18-1. Remote Control Block Diagram



18-2. Remote Control Circuit



SECTION 4

PARTS LIST

SAFETY PRECAUTION

The parts identified by Δ mark are critical for safety. Replace only with part number specified.
The mounting position of replacement is to be identical with originals. The substitute replacement parts which do not have the same safety characteristics as specified in the parts list may create shock, fire or other hazards.

NOTICE

The part number must be used when ordering parts in order to assist in processing, be sure to include the model number and description.

ABBREVIATIONS

1. Integrated circuit (IC)

2. Capacitor (Cap)

MF microfarad

PF picofarad (micro-microfarad)

3. Resistor (Res)

All resistance values are in ohms.

K Kilo (1000)

M Mega (1000000)

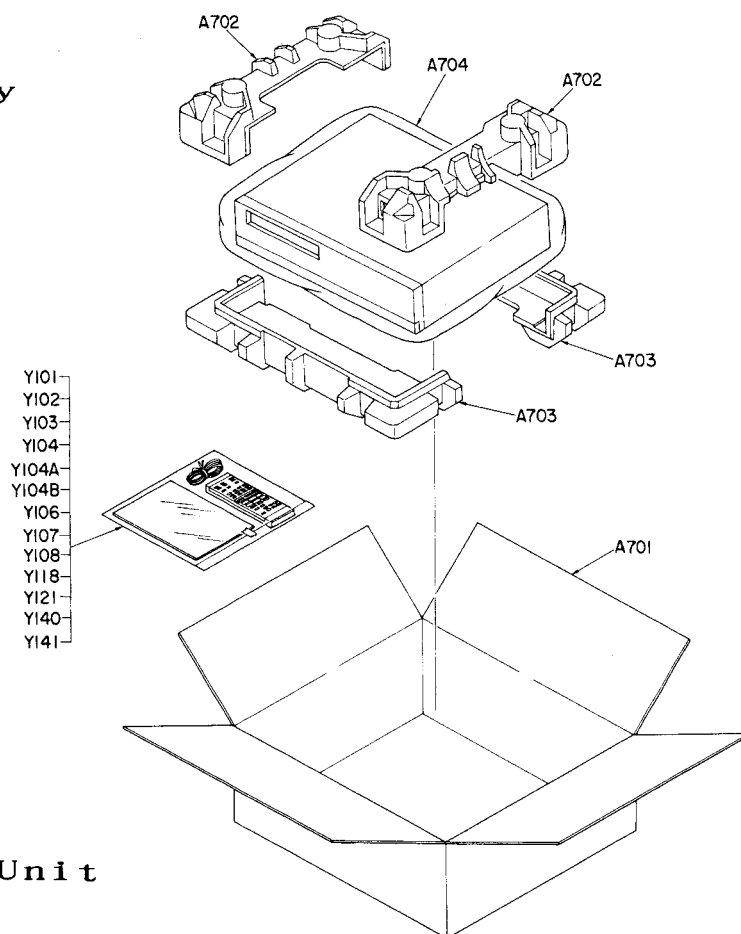
W Watt

4. Tolerance

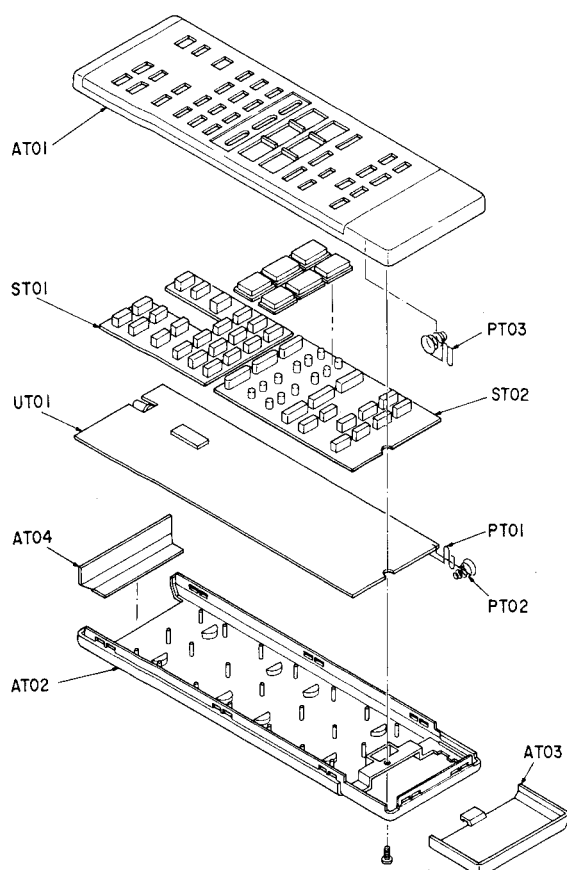
Symbol	G	J	K	M	N	Z	P	A
%	± 2	± 5	± 10	± 20	± 30	+80 -20	+100 -0	+100 -10

1.Exploded Views

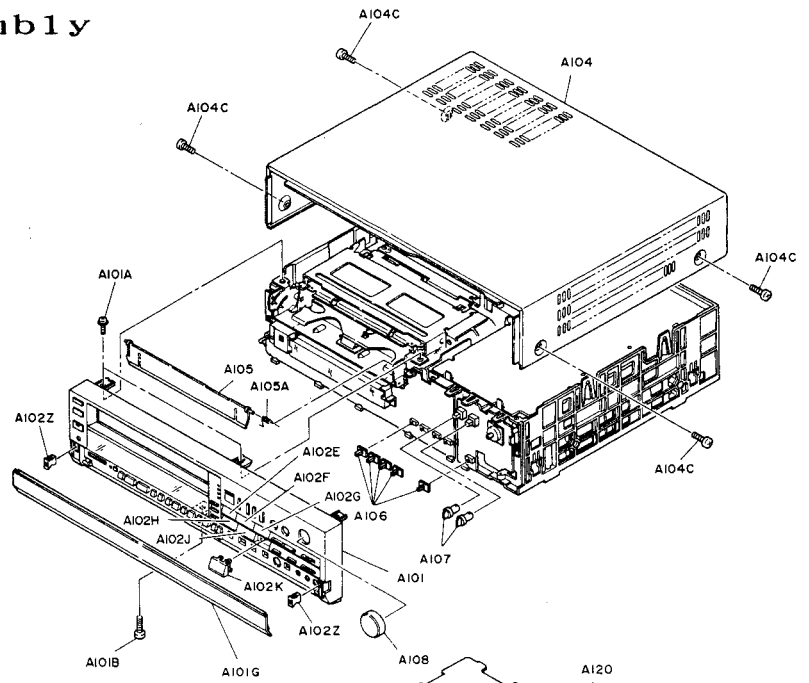
(1) Packing Assembly



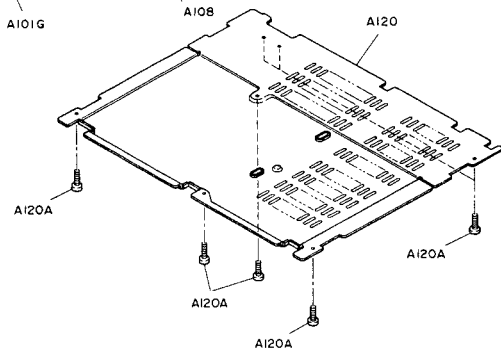
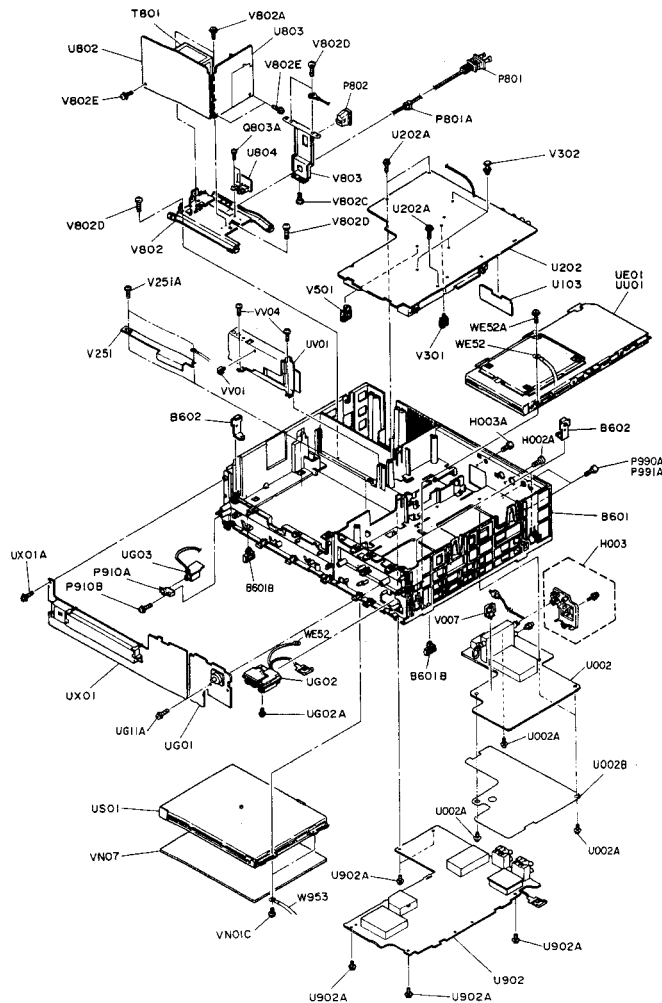
(2) Remote Control Unit



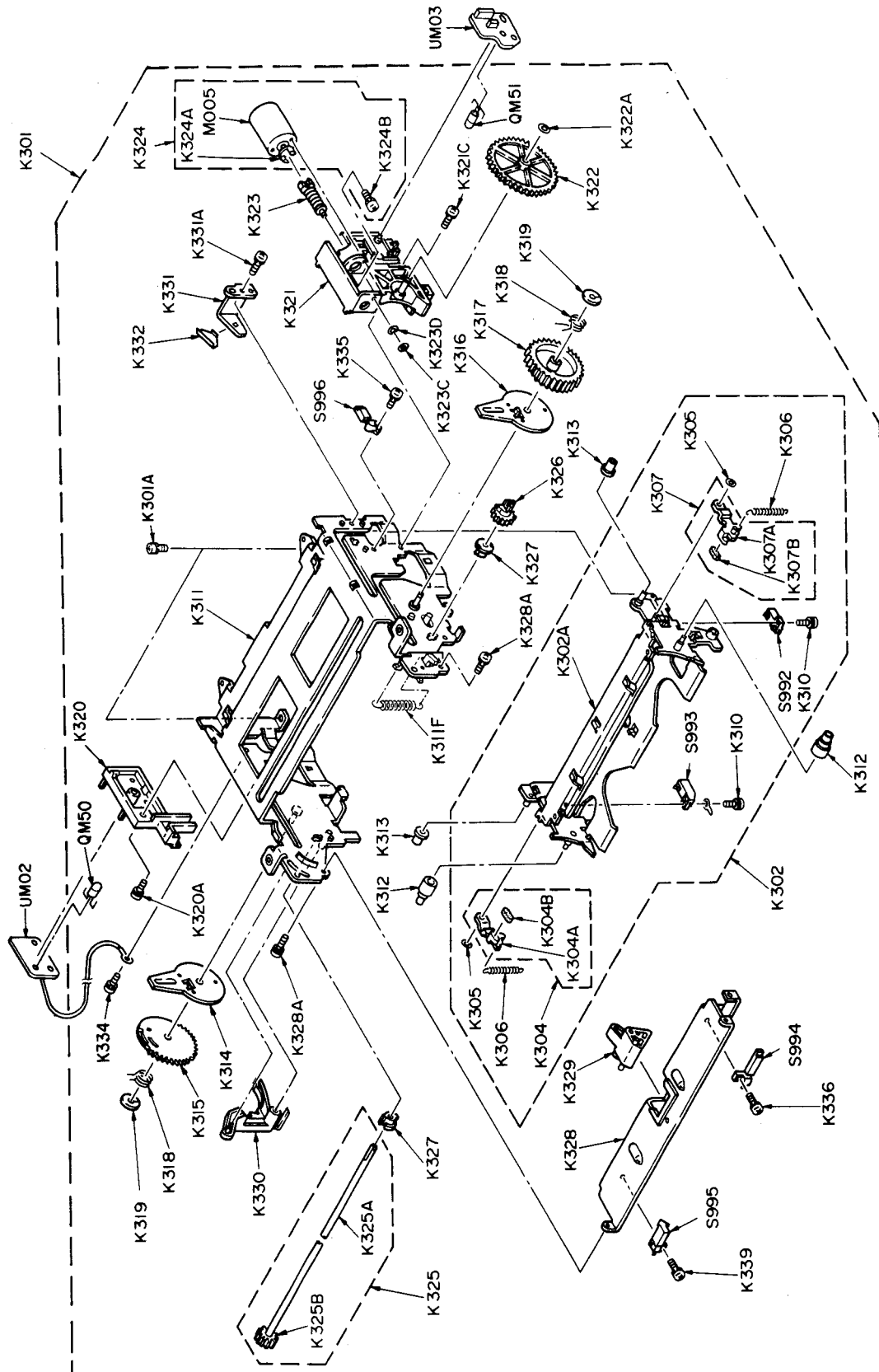
(3) Cabinet Assembly



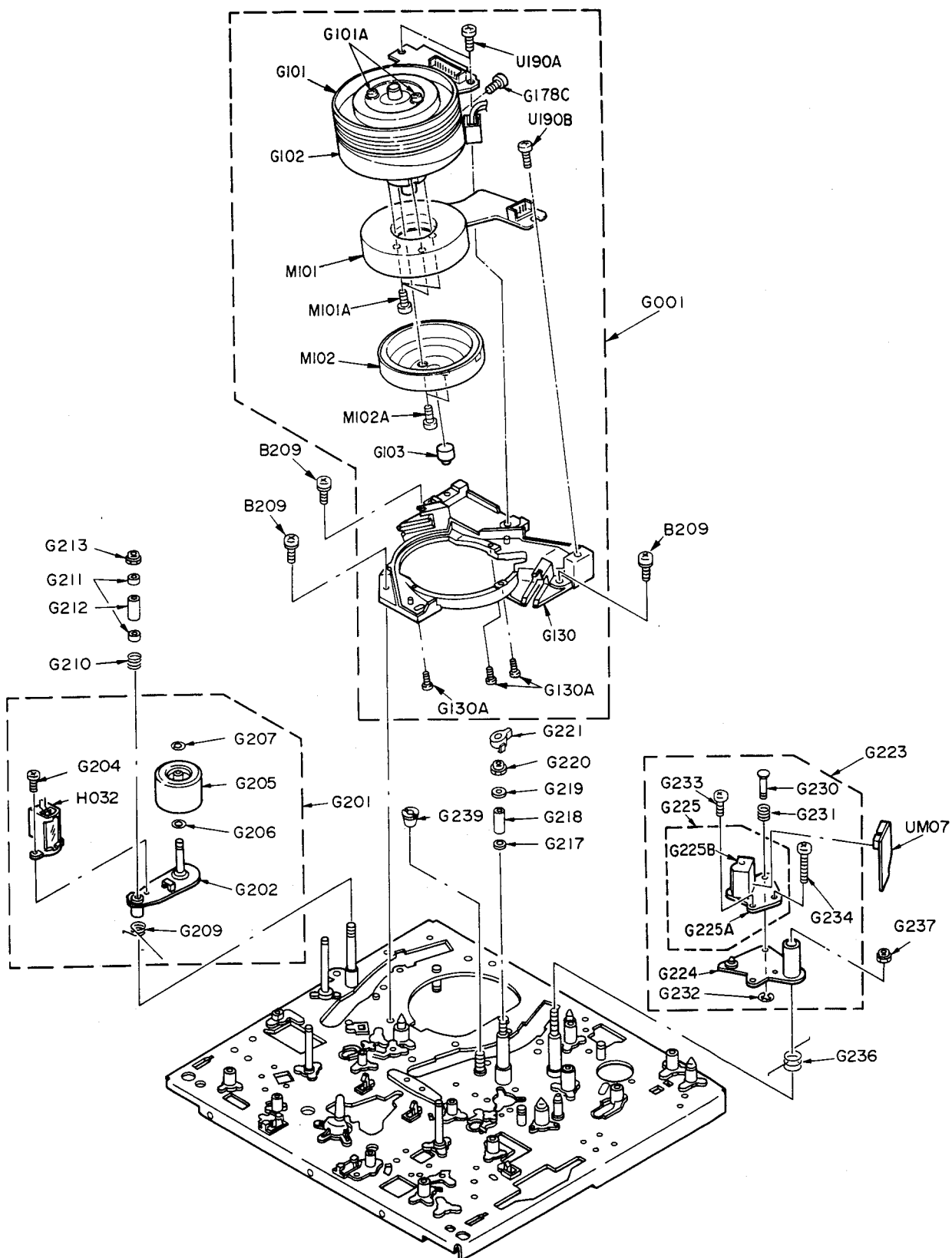
(4) Chassis Assembly



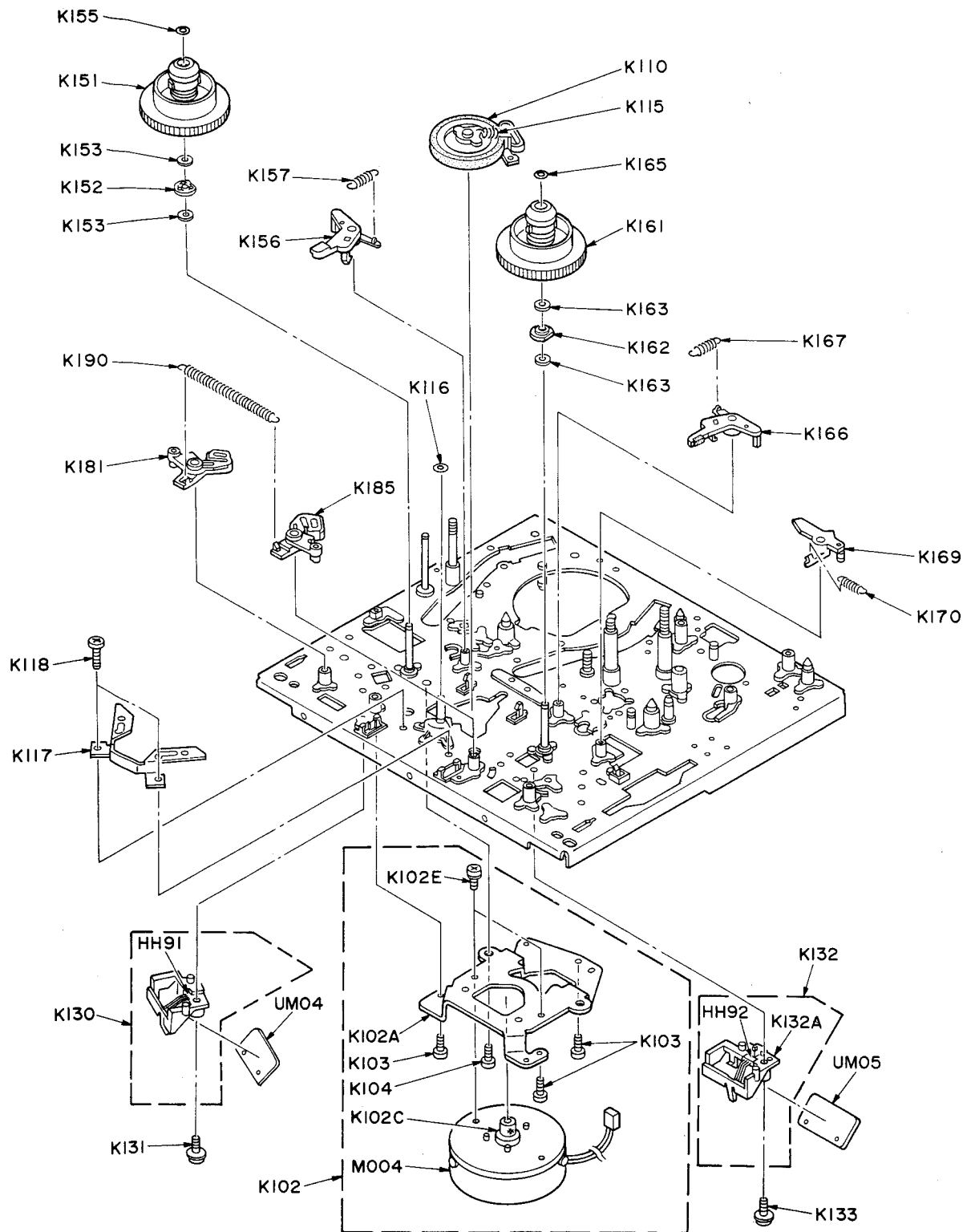
(5) Cassette Holder Assembly



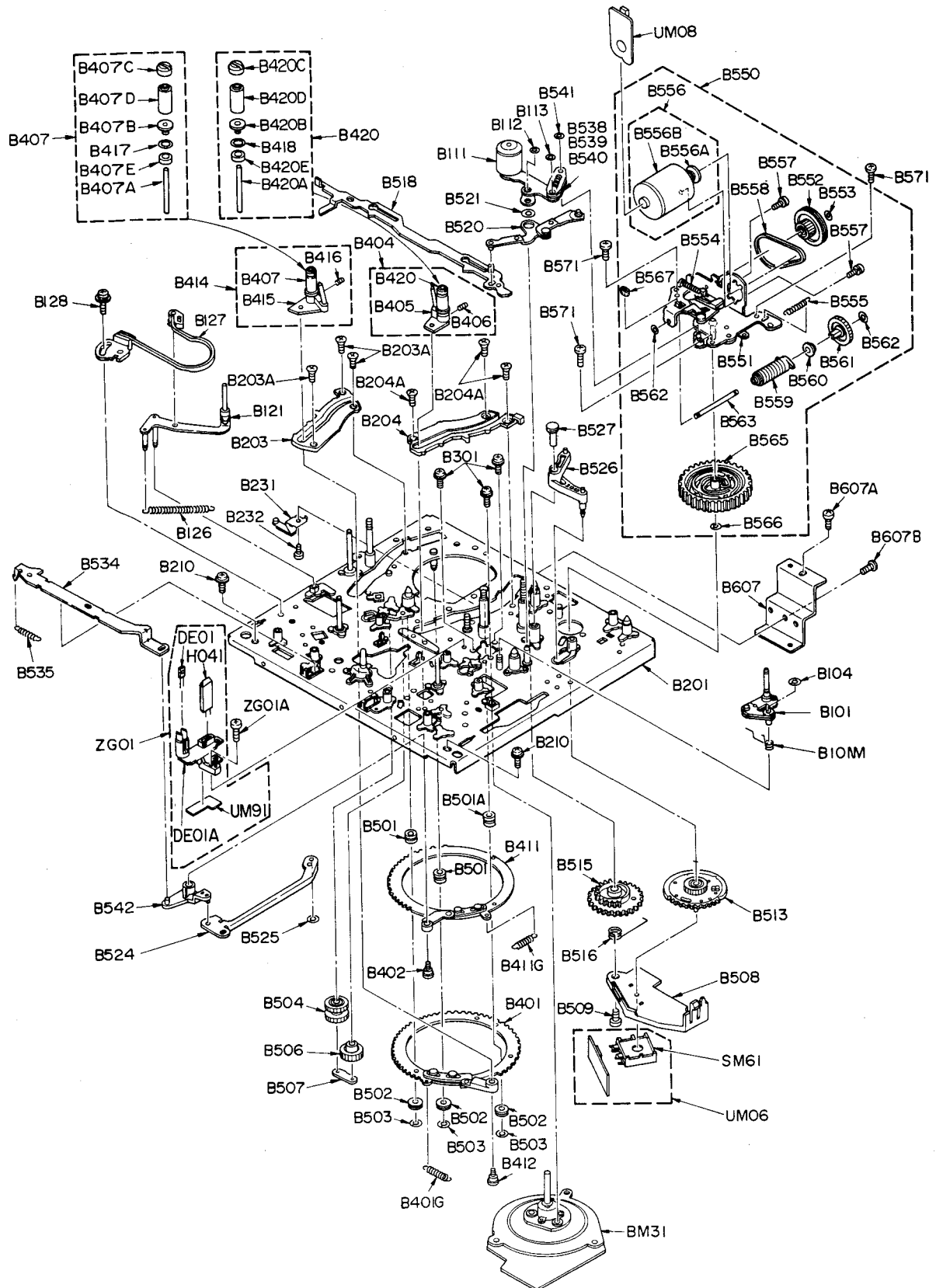
(6) Mechanical Parts (1)



(7) Mechanical Parts (2)



(8) Mechanical Parts (3)



2. Parts List

LOCATION NUMBER	PART NUMBER	DESCRIPTION
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ELECTRICAL PARTS

U002	70197356	P C Board Assy.PIF
I N T E G R A T E D C I R C U I T S		
IC001	23119143	IC M51365SP
ICA01	B0272490	IC TD6350P
T R A N S I S T O R S		
Q002	A6319020	Transistor 2SC1923-O
Q003	A6708871	Transistor 2SC388ATM
Q004	A6534430	Transistor 2SA1048-Y
Q005	A6332430	Transistor 2SC2458-Y
Q006	A6534430	Transistor 2SA1048-Y
Q007	A6012040	Transistor RN2204
Q008	A6012040	Transistor RN2204
Q009	A6534430	Transistor 2SA1048-Y
Q010	A6332430	Transistor 2SC2458-Y
Q011	A6509140	Transistor 2SA562TMV
Q012	A6002010	Transistor RN1201
Q013	A6002020	Transistor RN1202
Q014	A6319020	Transistor 2SC1923-O
Q015	A6332430	Transistor 2SC2458-Y
Q017	A6332430	Transistor 2SC2458-Y
Q018	A6509140	Transistor 2SA562TMV
QA02	A6317420	Transistor 2SC1815-O
QA03	A6317420	Transistor 2SC1815-O
QA04	A6332430	Transistor 2SC2458-Y
QA05	A6002040	Transistor RN1204
QA06	A6534430	Transistor 2SA1048-Y
QA07	A6534430	Transistor 2SA1048-Y
QA08	A6002010	Transistor RN1201
QA09	A6002010	Transistor RN1201
QD01	A6332430	Transistor 2SC2458-Y
QD62	A6012010	Transistor RN2201
QD64	A6342200	Transistor 2SC2878A
QD71	A6012010	Transistor RN2201
QD72	A6002040	Transistor RN1204
QD73	A6332430	Transistor 2SC2458-Y
QD99	A6002040	Transistor RN1204
QN89	A6002020	Transistor RN1202
QN90	A6533240	Transistor 2SA966-Y
QN91	A6012020	Transistor RN2202
QN92	A6012020	Transistor RN2202
QN93	A6325540	Transistor SC2236-Y
QN94	A6002020	Transistor RN1202
QN95	A6533240	Transistor 2SA966-Y
QN96	A6002020	Transistor RN1202
QN97	A6533240	Transistor 2SA966-Y
QN98	A6002020	Transistor RN1202
QN99	A6533240	Transistor 2SA966-Y
D I O D E S		
D001	A7160570	Diode 1SS176
D003	A7160570	Diode 1SS176
D004	A7160570	Diode 1SS176
D005	A7160570	Diode 1SS176
D006	A7151500	Diode 1SS201
D007	A7160570	Diode 1SS176
DA01	A7160570	Diode 1SS176
DA02	A7160570	Diode 1SS176
DA03	A7151450	Diode 1SS200
DA04	A7151500	Diode 1SS201
DD61	A7160570	Diode 1SS176
DD62	A7151450	Diode 1SS200
DD63	A7160570	Diode 1SS176
DD69	A7160570	Diode 1SS176
DN99	A7160570	Diode 1SS176
C O I L S		
L001	23237998	Coil.Peaking TRF4129AC
L003	23283338	Coil.Peaking TRF4R33J
L004	23262828	Coil.PIF TRF1065
L005	23262828	Coil.PIF TRF1065
L006	23237976	Coil.Peaking TRF4820AC
L007	23237977	Coil.Peaking TRF4680AC

LOCATION NUMBER	PART NUMBER	DESCRIPTION
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L008	23237977	Coil.Peaking TRF4680AC
L009	23237977	Coil.Peaking TRF4680AC
L010	23238739	Coil.Peaking TRF4150AH
L011	23283398	Coil.Peaking TRF4R39J
L012	23237980	Coil.Peaking TRF4390AC
L013	23237977	Coil.Peaking TRF4680AC
L014	23262795	Coil.IF TRF1095
L015	23252918	Coil.SIF TRF6019
L020	23283228	Coil.Peaking TRF4R22J
L051	23262743	Coil.IF TRF1130
L052	23232897	Coil.Variable TRF3104
LD01	23107798	Filter.TLC1066. 15. 7KHz
LD63	23107803	Filter.TLC1063.13KHz
LD64	23107803	Filter.TLC1063.13KHz
C A P A C I T O R S		
C001	24436150	Cap.Ceramic 15PF J 50V
C002	24232103	Cap.Ceramic 0. 01MF Z 50V
C003	24232103	Cap.Ceramic 0. 01MF Z 50V
C004	24232103	Cap.Ceramic 0. 01MF Z 50V
C005	24232103	Cap.Ceramic 0. 01MF Z 50V
C006	24232103	Cap.Ceramic 0. 01MF Z 50V
C007	24232103	Cap.Ceramic 0. 01MF Z 50V
C008	24232103	Cap.Ceramic 0. 01MF Z 50V
C009	24232103	Cap.Ceramic 0. 01MF Z 50V
C010	24436160	Cap.Ceramic 16PF J 50V
C012	24206479	Cap.Electrolytic 4. 7MF M 50V
C013	24617994	Cap.Electrolytic 0. 47MF M 50V
C015	24203470	Cap.Electrolytic 47MF M 16V
C016	24232103	Cap.Ceramic 0. 01MF Z 50V
C017	24203470	Cap.Electrolytic 47MF M 16V
C018	24232103	Cap.Ceramic 0. 01MF Z 50V
C019	24591104	Cap.Plastic 0. 1MF J 50V
C020	24232103	Cap.Ceramic 0. 01MF Z 50V
C021	24232103	Cap.Ceramic 0. 01MF Z 50V
C022	24203470	Cap.Electrolytic 47MF M 16V
C023	24232223	Cap.Ceramic 0. 022MF Z 50V
C024	24538104	Cap.Plastic 0. 1MF J 50V
C025	24206010	Cap.Electrolytic 1MF M 50V
C026	24203100	Cap.Electrolytic 10MF M 16V
C028	24538563	Cap.Plastic 0. 056MF J 50V
C029	24436050	Cap.Ceramic 5PF J 50V
C030	24232103	Cap.Ceramic 0. 01MF Z 50V
C031	24085981	Cap.Electrolytic 10MF M 16V
C032	24212221	Cap.Ceramic 220PF K 50V
C033	24206010	Cap.Electrolytic 1MF M 50V
C034	24232103	Cap.Ceramic 0. 01MF Z 50V
C035	24203470	Cap.Electrolytic 47MF M 16V
C036	24206478	Cap.Electrolytic 0. 47MF M 50V
C037	24357151	Cap.Ceramic 150PF J 50V
C038	24436101	Cap.Ceramic 100PF J 50V
C039	24538104	Cap.Plastic 0. 1MF J 50V
C040	24436560	Cap.Ceramic 56PF J 50V
C041	24436430	Cap.Ceramic 43PF J 50V
C042	24232472	Cap.Ceramic 4700PF Z 50V
C045	24203220	Cap.Electrolytic 22MF M 16V
CA01	24202330	Cap.Electrolytic 33MF M 10V
CA02	24232103	Cap.Ceramic 0. 01MF Z 50V
CA03	24232102	Cap.Ceramic 1000PF Z 50V
CA04	24232102	Cap.Ceramic 1000PF Z 50V
CA05	24436240	Cap.Ceramic 24PF J 50V
CA06	24436240	Cap.Ceramic 24PF J 50V
CA07	24232103	Cap.Ceramic 0. 01MF Z 50V
CA08	24591104	Cap.Plastic 0. 1MF J 50V
CA09	24591103	Cap.Plastic 0. 01MF J 50V
CA10	24797101	Cap.Electrolytic 100MF M 50V
CD01	24206229	Cap.Electrolytic 2. 2MF M 50V
CD02	24203100	Cap.Electrolytic 10MF M 16V
CD61	24206229	Cap.Electrolytic 2. 2MF M 50V
CD62	24203100	Cap.Electrolytic 10MF M 16V
CD63	24206229	Cap.Electrolytic 2. 2MF M 50V
CD66	24591472	Cap.Plastic 4700PF J 50V
CD67	24591472	Cap.Plastic 4700PF J 50V
CD74	24203100	Cap.Electrolytic 10MF M 16V

LOCATION NUMBER	PART NUMBER	DESCRIPTION			
CD78	24203100	Cap.Electrolytic	10MF	M 16V	
CN98	24203470	Cap.Electrolytic	47MF	M 16V	
CN99	24203101	Cap.Electrolytic	100MF	M 16V	
RESISTORS					
R001	24366201	Res.Carbon	200	J 1/6W	
R002	24366332	Res.Carbon	3. 3K	J 1/6W	
R003	24366162	Res.Carbon	1. 6K	J 1/6W	
R004	24366621	Res.Carbon	620	J 1/6W	
R005	24366621	Res.Carbon	620	J 1/6W	
R007	24366331	Res.Carbon	330	J 1/6W	
R008	24366431	Res.Carbon	430	J 1/6W	
R009	24366431	Res.Carbon	430	J 1/6W	
R010	24366101	Res.Carbon	100	J 1/6W	
R011	24366510	Res.Carbon	51	J 1/6W	
R013	24366102	Res.Carbon	1K	J 1/6W	
R014	24366103	Res.Carbon	10K	J 1/6W	
R015	24366202	Res.Carbon	2K	J 1/6W	
R016	24366562	Res.Carbon	5. 6K	J 1/6W	
R017	24366392	Res.Carbon	3. 9K	J 1/6W	
R018	24366222	Res.Carbon	2. 2K	J 1/6W	
R019	24366824	Res.Carbon	820K	J 1/6W	
R020	24366102	Res.Carbon	1K	J 1/6W	
R021	24366682	Res.Carbon	6. 8K	J 1/6W	
R022	24366682	Res.Carbon	6. 8K	J 1/6W	
R023	24366151	Res.Carbon	150	J 1/6W	
R024	24366102	Res.Carbon	1K	J 1/6W	
R025	24366102	Res.Carbon	1K	J 1/6W	
R026	24366511	Res.Carbon	510	J 1/6W	
R027	24366681	Res.Carbon	680	J 1/6W	
R028	24366562	Res.Carbon	5. 6K	J 1/6W	
R029	24366103	Res.Carbon	10K	J 1/6W	
R030	24366104	Res.Carbon	100K	J 1/6W	
R031	24380103	Res.Carbon	10K	J 1/8W	
R032	24366474	Res.Carbon	470K	J 1/6W	
R033	24366103	Res.Carbon	10K	J 1/6W	
R034	24366132	Res.Carbon	1. 3K	J 1/6W	
R035	24366152	Res.Carbon	1. 5K	J 1/6W	
R037	24366474	Res.Carbon	470K	J 1/6W	
R038	24366564	Res.Carbon	560K	J 1/6W	
R039	24366224	Res.Carbon	220K	J 1/6W	
R040	24366105	Res.Carbon	1M	J 1/6W	
R041	24366104	Res.Carbon	100K	J 1/6W	
R042	24366304	Res.Carbon	300K	J 1/6W	
R043	24366562	Res.Carbon	5. 6K	J 1/6W	
R044	24366330	Res.Carbon	33	J 1/6W	
R045	24366561	Res.Carbon	560	J 1/6W	
R046	24366132	Res.Carbon	1. 3K	J 1/6W	
R047	24366331	Res.Carbon	330	J 1/6W	
R048	24366472	Res.Carbon	4. 7K	J 1/6W	
R049	24366472	Res.Carbon	4. 7K	J 1/6W	
R052	24066983	Res.Variable	5K		
R060	24366162	Res.Carbon	1. 6K	J 1/6W	
R061	24366102	Res.Carbon	1K	J 1/6W	
R063	24366472	Res.Carbon	4. 7K	J 1/6W	
R064	24366472	Res.Carbon	4. 7K	J 1/6W	
R065	24366104	Res.Carbon	100K	J 1/6W	
R066	24366102	Res.Carbon	1K	J 1/6W	
R067	24366102	Res.Carbon	1K	J 1/6W	
R068	24366112	Res.Carbon	1. 1K	J 1/6W	
R069	24366821	Res.Carbon	820	J 1/6W	
R070	24366912	Res.Carbon	9. 1K	J 1/6W	
R071	24366472	Res.Carbon	4. 7K	J 1/6W	
R072	24366472	Res.Carbon	4. 7K	J 1/6W	
R073	24366162	Res.Carbon	1. 6K	J 1/6W	
R081	24366332	Res.Carbon	3. 3K	J 1/6W	
ΔR090	24942155	Res.Composition	1. 5M	J 1/2W	
RA01	24366472	Res.Carbon	4. 7K	J 1/6W	
RA02	24366472	Res.Carbon	4. 7K	J 1/6W	
RA03	24366472	Res.Carbon	4. 7K	J 1/6W	
RA04	24366201	Res.Carbon	200	J 1/6W	
RA05	24366151	Res.Carbon	150	J 1/6W	
RA06	24366562	Res.Carbon	5. 6K	J 1/6W	
RA07	24366823	Res.Carbon	82K	J 1/6W	
RA08	24366561	Res.Carbon	560	J 1/6W	
RA09	24366152	Res.Carbon	1. 5K	J 1/6W	

LOCATION NUMBER	PART NUMBER	DESCRIPTION			
RA10	24366122	Res.Carbon	1. 2K	J 1/6W	
RA11	24366564	Res.Carbon	560K	J 1/6W	
RA12	24366473	Res.Carbon	47K	J 1/6W	
RA13	24366273	Res.Carbon	27K	J 1/6W	
RA14	24366562	Res.Carbon	5. 6K	J 1/6W	
RA15	24366473	Res.Carbon	47K	J 1/6W	
RA16	24366822	Res.Carbon	8. 2K	J 1/6W	
RA17	24366822	Res.Carbon	8. 2K	J 1/6W	
RA18	24366473	Res.Carbon	47K	J 1/6W	
RA19	24366363	Res.Carbon	36K	J 1/6W	
RA20	24366124	Res.Carbon	120K	J 1/6W	
RA21	24366363	Res.Carbon	36K	J 1/6W	
RA22	24366124	Res.Carbon	120K	J 1/6W	
RA23	24366332	Res.Carbon	3. 3K	J 1/6W	
RD01	24366473	Res.Carbon	47K	J 1/6W	
RD02	24366473	Res.Carbon	47K	J 1/6W	
RD03	24366303	Res.Carbon	30K	J 1/6W	
RD04	24366622	Res.Carbon	6. 2K	J 1/6W	
RD05	24366272	Res.Carbon	2. 7K	J 1/6W	
RD06	24366272	Res.Carbon	2. 7K	J 1/6W	
RD07	24366113	Res.Carbon	11K	J 1/6W	
RD54	24066983	Res.Variable	5K		
RD62	24366103	Res.Carbon	10K	J 1/6W	
RD63	24366473	Res.Carbon	47K	J 1/6W	
RD70	24366203	Res.Carbon	20K	J 1/6W	
RD71	24366102	Res.Carbon	1K	J 1/6W	
RD78	24366242	Res.Carbon	2. 4K	J 1/6W	
RD79	24366242	Res.Carbon	2. 4K	J 1/6W	
RD80	24366562	Res.Carbon	5. 6K	J 1/6W	
RD81	24366562	Res.Carbon	5. 6K	J 1/6W	
RD83	24366102	Res.Carbon	1K	J 1/6W	
RD85	24366332	Res.Carbon	3. 3K	J 1/6W	
RD86	24366102	Res.Carbon	1K	J 1/6W	
RD87	24366101	Res.Carbon	100	J 1/6W	
RD90	24366433	Res.Carbon	43K	J 1/6W	
RD91	24366243	Res.Carbon	24K	J 1/6W	
RD92	24366512	Res.Carbon	5. 1K	J 1/6W	
RD93	24366432	Res.Carbon	4. 3K	J 1/6W	
RD94	24366104	Res.Carbon	100K	J 1/6W	
RN90	24380472	Res.Carbon	4. 7K	J 1/8W	
RN91	24366102	Res.Carbon	1K	J 1/6W	
RN92	24366472	Res.Carbon	4. 7K	J 1/6W	
RN93	24366471	Res.Carbon	470	J 1/6W	
RN94	24366103	Res.Carbon	10K	J 1/6W	
RN95	24366472	Res.Carbon	4. 7K	J 1/6W	
RN96	24366472	Res.Carbon	4. 7K	J 1/6W	
RN97	24366471	Res.Carbon	470	J 1/6W	
RN98	24380471	Res.Carbon	470	J 1/8W	
RN99	24366222	Res.Carbon	2. 2K	J 1/6W	
MISCELLANEOUS					
H001	70121068	Tuner.694FX2			
H003	23142535	ANT Terminal.VT824			
HD01	70137126	MTS Decoder Module			
PA03	70163071	Phono Jack			
SA01	23145452	Slide Switch.2C3P			
XA01	23153969	Crystal			
Z001	A5610690	Filter.F1032B.45. 75MHz			
Z002	A5613161	Filter.F1322B.41. 25MHz			
Z003	23107976	Video Trap	4. 5MHz		
Z004	23107920	Filter.4. 5MHz			
Z005	23107749	Filter.TEM1007			
Z006	23107749	Filter.TEM1007			
Z007	23107749	Filter.TEM1007			
Z008	23107749	Filter.TEM1007			
UG01	70197357	P C Board Assy.SW Control			
INTEGRATED CIRCUITS					
ICG05	70119621	IC		NJM2068S	
CAPACITORS					
CG10	24203101	Cap.Electrolytic	100MF	M 16V	
CG11	24203101	Cap.Electrolytic	100MF	M 16V	
RESISTORS					
R257	24069645	Res.Variable	10K		
R556	24069653	Res.Variable	500K		
RG10	24360101	Res.Carbon	100	J 1/8W	

LOCATION NUMBER	P A R T NUMBER	DESCRIPTION			
RG11	24366272	Res.Carbon	2. 7K	J 1/6W	
RG12	24366102	Res.Carbon	1K	J 1/6W	
RG13	24366102	Res.Carbon	1K	J 1/6W	
RG14	24366272	Res.Carbon	2. 7K	J 1/6W	
RG15	24366101	Res.Carbon	100	J 1/6W	
RG52	24069549	Res.Variable	20K		
RG53	24069550	Res.Variable	5K		

M I S C E L L A N E O U S

S201	23145605	Slide Switch.2C3P			
SG02	23145605	Slide Switch.2C3P			
SG07	23145533	Slide Switch.2C2P			
SL07	23145510	Push Switch.1C1P			
SL08	23145510	Push Switch.1C1P			
SL11	23145510	Push Switch.1C1P			
SX18	23145510	Push Switch.1C1P			

U202 70197355 P C Board Assy.Main

I N T E G R A T E D C I R C U I T S

IC101	B0379070	IC	TA8607P		
IC201	B0379245	IC	TA8624N		
IC202	B0379060	IC	TA8606N		
IC203	B0589580	IC	TL8708P		
IC301	B0325400	IC	TA7348P		
IC302	B0325420	IC	TA7350P		
IC401	B0379040	IC	TA8604N		
IC402	B0325570	IC	TA7365P		
IC501	B0272639	IC	TD6361N-D2		
IC502	B0351500	IC	TA75902P		
IC503	70119581	IC	NJM2902N		
IC504	B0480815	IC	TC5081AP		
IC505	B0475382	IC	TC4538BP		
IC506	B0470662	IC	TC4066BP		
IC507	B0470303	IC	TC4030BP		
IC508	B0475382	IC	TC4538BP		
IC509	70119423	IC	BA222		
IC601	B0517826	IC	47C460AN9438		
IC602	B0320635	IC	TA7288P		
IC603	B0320440	IC	TA7267P		
IC604	B0347230	IC	TA75339P		

T R A N S I S T O R S

Q102	A6332430	Transistor	2SC2458-Y		
Q103	A6534430	Transistor	2SA1048-Y		
Q104	A6534430	Transistor	2SA1048-Y		
Q105	A6002020	Transistor	RN1202		
Q106	A6002040	Transistor	RN1204		
Q107	A6332430	Transistor	2SC2458-Y		
Q109	A6002020	Transistor	RN1202		
Q110	A6002020	Transistor	RN1202		
Q204	A6332430	Transistor	2SC2458-Y		
Q206	A6002030	Transistor	RN1203		
Q209	A6534430	Transistor	2SA1048-Y		
Q210	A6002020	Transistor	RN1202		
Q211	A6332430	Transistor	2SC2458-Y		
Q212	A6012050	Transistor	RN2205		
Q213	A6002020	Transistor	RN1202		
Q214	A6534430	Transistor	2SA1048-Y		
Q216	A6534430	Transistor	2SA1048-Y		
Q217	A6332430	Transistor	2SC2458-Y		
Q218	A6332430	Transistor	2SC2458-Y		
Q219	A6332430	Transistor	2SC2458-Y		
Q221	A6332540	Transistor	2SC2668-Y		
Q304	A6534040	Transistor	2SA1015-Y		
Q305	A6534430	Transistor	2SA1048-Y		
Q306	A6332430	Transistor	2SC2458-Y		
Q307	A6332540	Transistor	2SC2668-Y		
Q308	A6332540	Transistor	2SC2668-Y		
Q309	A6332540	Transistor	2SC2668-Y		
Q310	A6332540	Transistor	2SC2668-Y		
Q312	A6012020	Transistor	RN2202		
Q313	A6332450	Transistor	2SC2458-BL		
Q314	A6012020	Transistor	RN2202		
Q315	A6332450	Transistor	2SC2458-BL		
Q316	A6002040	Transistor	RN1204		
Q317	A6332450	Transistor	2SC2458-BL		
Q318	A6534430	Transistor	2SA1048-Y		

LOCATION NUMBER	P A R T NUMBER	DESCRIPTION			
Q322	A6002020	Transistor	RN1202		
Q323	A6002020	Transistor	RN1202		
Q324	A6002020	Transistor	RN1202		
Q325	A6002020	Transistor	RN1202		
Q326	A6332430	Transistor	2SC2458-Y		
Q330	A6002020	Transistor	RN1202		
Q331	A6002020	Transistor	RN1202		
Q403	A6332430	Transistor	2SC2458-Y		
Q404	A6332430	Transistor	2SC2458-Y		
Q405	A6534430	Transistor	2SA1048-Y		
Q406	A6534430	Transistor	2SA1048-Y		
Q407	A6002040	Transistor	RN1204		
Q408	A6332430	Transistor	2SC2458-Y		
Q409	A6002040	Transistor	RN1204		
Q411	A6332430	Transistor	2SC2458-Y		
Q415	A6319300	Transistor	2SC1959-Y		
Q416	A6534430	Transistor	2SA1048-Y		
Q511	A6012040	Transistor	RN2204		
Q512	A6012040	Transistor	RN2204		
Q513	A6002040	Transistor	RN1204		
Q514	A6002040	Transistor	RN1204		
Q515	A6002040	Transistor	RN1204		
Q516	A6844100	Transistor	2SD686		
Q517	A6841900	Transistor	2SD549		
Q518	A6533240	Transistor	2SA966-Y		
Q519	A6012040	Transistor	RN2204		
Q520	A6002040	Transistor	RN1204		
Q521	A6332430	Transistor	2SC2458-Y		
Q522	A6002030	Transistor	RN1203		
Q523	A6012040	Transistor	RN2204		
Q524	A6012040	Transistor	RN2204		
Q525	A6534430	Transistor	2SA1048-Y		
Q526	A6012040	Transistor	RN2204		
Q527	A6012040	Transistor	RN2204		
Q528	A6002040	Transistor	RN1204		
Q529	A6012040	Transistor	RN2204		
Q530	A6012040	Transistor	RN2204		
Q531	A6012040	Transistor	RN2204		
Q532	A6002040	Transistor	RN1204		
Q533	A6002030	Transistor	RN1203		
Q534	A6002030	Transistor	RN1203		
Q535	A6002040	Transistor	RN1204		
Q536	A6002040	Transistor	RN1204		
Q538	A6002040	Transistor	RN1204		
Q539	A6332430	Transistor	2SC2458-Y		
Q541	A6002040	Transistor	RN1204		
Q542	A6012040	Transistor	RN2204		
Q544	A6534430	Transistor	2SA1048-Y		
Q545	A6534430	Transistor	2SA1048-Y		
Q549	A6012040	Transistor	RN2204		
Q550	A6012040	Transistor	RN2204		
Q551	A6002040	Transistor	RN1204		
Q555	A6002040	Transistor	RN1204		
Q599	A6002040	Transistor	RN1204		
Q609	A6534430	Transistor	2SA1048-Y		
Q610	A6534430	Transistor	2SA1048-Y		
Q613	A6533240	Transistor	2SA966-Y		
Q614	A6534430	Transistor	2SA1048-Y		
Q615	A6534430	Transistor	2SA1048-Y		
Q616	A6533240	Transistor	2SA966-Y		
Q617	A6533240	Transistor	2SA966-Y		
Q618	A6002060	Transistor	RN1206		
Q619	A6002010	Transistor	RN1201		
Q620	A6325540	Transistor	SC2236-Y		
Q621	A6002060	Transistor	RN1206		
Q622	A6002030	Transistor	RN1203		
Q624	A6012030	Transistor	RN2203		
Q625	A6633620	Transistor	2SB834-Y		
Q626	A6332430	Transistor	2SC2458-Y		
Q627	A6002010	Transistor	RN1201		
Q628	A6002030	Transistor	RN1203		
Q629	A6002030	Transistor	RN1203		
Q630	A6002010	Transistor	RN1201		
Q631	A6002020	Transistor	RN1202		
Q633	A6332430	Transistor	2SC2458-Y		

LOCATION NUMBER	PART NUMBER	DESCRIPTION	
Q635	A6012040	Transistor	RN2204
Q639	A6012040	Transistor	RN2204
Q640	A6332430	Transistor	2SC2458-Y
Q642	A6002010	Transistor	RN1201
Q643	A6002040	Transistor	RN1204
Q644	A6012040	Transistor	RN2204
Q645	A6002050	Transistor	RN1205

DIODES

D201	A7160570	Diode	ISS176
D202	A7160570	Diode	ISS176
D203	A7151500	Diode	ISS201
D205	A7110159	Diode.Zener	05Z 7. 5-X
D206	A7151450	Diode	ISS200
D207	A7151500	Diode	ISS201
D208	A7160570	Diode	ISS176
D303	A7160570	Diode	ISS176
D304	A7160570	Diode	ISS176
D307	A7151500	Diode	ISS201
D308	A7151450	Diode	ISS200
D403	A7160570	Diode	ISS176
D404	A7160570	Diode	ISS176
D501	A7160570	Diode	ISS176
D503	A7151500	Diode	ISS201
D504	A7152800	Diode	ISS227
D505	A7160570	Diode	ISS176
D506	A7160570	Diode	ISS176
D507	A7152800	Diode	ISS227
D508	A7160570	Diode	ISS176
D509	A7152800	Diode	ISS227
D510	A7152800	Diode	ISS227
D511	A7160570	Diode	ISS176
D512	A7110040	Diode.Zener	05Z5.1-X
D513	A7160570	Diode	ISS176
D514	A7160570	Diode	ISS176
D515	A7160570	Diode	ISS176
D518	A7160570	Diode	ISS176
D519	A7160570	Diode	ISS176
D520	A7160570	Diode	ISS176
D602	A7160570	Diode	ISS176
D605	A7160570	Diode	ISS176
D606	A7160570	Diode	ISS176
D607	A7160570	Diode	ISS176
D609	A7160570	Diode	ISS176
D610	A7160570	Diode	ISS176
D611	A7160570	Diode	ISS176
D612	A7110462	Diode.Zener	05Z 13-Y
D613	A7160570	Diode	ISS176
D614	A7160570	Diode	ISS176
D615	A7160570	Diode	ISS176
D616	A7160570	Diode	ISS176
D617	A7160570	Diode	ISS176
DA99	23115922	Diode.Zener	UPC574J

COILS

L109	23238706	Coil.Peaking	TRF4470AJ
L111	23237974	Coil.Peaking	TRF4121AC
L112	23237987	Coil.Peaking	TRF4100AC
L114	23237981	Coil.Peaking	TRF4330AC
L115	23238702	Coil.Peaking	TRF4101AC
L201	23238702	Coil.Peaking	TRF4101AC
L202	23237911	Coil.Peaking	TRF4201AC
L203	23238904	Coil.Peaking	TRF4331AC
L204	23238906	Coil.Peaking	TRF4221AC
L205	23239835	Coil.Peaking	TRF4109AJ
L206	23261984	Coil.Choke	HC3035
L207	23238702	Coil.Peaking	TRF4101AC
L208	23238707	Coil.Peaking	TRF4390AJ
L209	23238706	Coil.Peaking	TRF4470AJ
L210	23237972	Coil.Peaking	TRF4181AC
L211	23237973	Coil.Peaking	TRF4151AC
L212	23237975	Coil.Peaking	TRF4101AC
L301	23238702	Coil.Peaking	TRF4101AC
L302	23238706	Coil.Peaking	TRF4470AJ
L401	23237984	Coil.Peaking	TRF4180AC
L402	23237987	Coil.Peaking	TRF4100AC
L403	23237979	Coil.Peaking	TRF4470AC

LOCATION NUMBER	PART NUMBER	DESCRIPTION	
L404	23237974	Coil.Peaking	TRF4121AC
L405	23238904	Coil.Peaking	TRF4331AC
L406	23237984	Coil.Peaking	TRF4180AC
L407	23238715	Coil.Peaking	TRF4829AJ
L409	23238714	Coil.Peaking	TRF4100AJ
L410	23238714	Coil.Peaking	TRF4100AJ
L411	23237976	Coil.Peaking	TRF4820AC
L412	23238920	Coil.Peaking	TRF4150AC
L454	23232959	Coil.Variable	TRF3060
L601	23238653	Coil.Peaking	TRF4470A1

CAPACITORS

C130	24206478	Cap.Electrolytic	0. 47MF	M 50V
C131	24474103	Cap.Ceramic	0. 01MF	N 50V
C132	24473360	Cap.Ceramic	36PF	J 50V
C133	24474102	Cap.Ceramic	1000PF	K 50V
C134	24474102	Cap.Ceramic	1000PF	K 50V
C135	24851104	Cap.Ceramic	0. 1MF	K 25V
C136	24201220	Cap.Electrolytic	22MF	M 6. 3V
C137	24474103	Cap.Ceramic	0. 01MF	N 50V
C138	24436561	Cap.Ceramic	560PF	J 50V
C139	24474103	Cap.Ceramic	0. 01MF	N 50V
C140	24436121	Cap.Ceramic	120PF	J 50V
C141	24474103	Cap.Ceramic	0. 01MF	N 50V
C143	24436220	Cap.Ceramic	22PF	J 50V
C144	24851683	Cap.Ceramic	0. 068MF	K 25V
C201	24474103	Cap.Ceramic	0. 01MF	N 50V
C202	24474103	Cap.Ceramic	0. 01MF	N 50V
C203	24474103	Cap.Ceramic	0. 01MF	N 50V
C204	24473130	Cap.Ceramic	13PF	J 50V
C205	24436151	Cap.Ceramic	150PF	J 50V
C206	24474103	Cap.Ceramic	0. 01MF	N 50V
C207	24473150	Cap.Ceramic	15PF	J 50V
C208	24436151	Cap.Ceramic	150PF	J 50V
C209	24851104	Cap.Ceramic	0. 1MF	K 25V
C210	24436101	Cap.Ceramic	100PF	J 50V
C211	24851822	Cap.Ceramic	8200PF	K 25V
C212	24851103	Cap.Ceramic	0. 01MF	K 25V
C213	24436151	Cap.Ceramic	150PF	J 50V
C214	24851104	Cap.Ceramic	0. 1MF	K 25V
C215	24203100	Cap.Electrolytic	10MF	M 16V
C216	24474103	Cap.Ceramic	0. 01MF	N 50V
C217	24206478	Cap.Electrolytic	0. 47MF	M 50V
C218	24205479	Cap.Electrolytic	4. 7MF	M 35V
C219	24206010	Cap.Electrolytic	1MF	M 50V
C220	24436101	Cap.Ceramic	100PF	J 50V
C221	24202101	Cap.Electrolytic	100MF	M 10V
C222	24474103	Cap.Ceramic	0. 01MF	N 50V
C223	24436301	Cap.Ceramic	300PF	J 50V
C224	24206478	Cap.Electrolytic	0. 47MF	M 50V
C225	24474103	Cap.Ceramic	0. 01MF	N 50V
C226	24206010	Cap.Electrolytic	1MF	M 50V
C227	24474103	Cap.Ceramic	0. 01MF	N 50V
C228	24473470	Cap.Ceramic	47PF	J 50V
C229	24205479	Cap.Electrolytic	4. 7MF	M 35V
C230	24474103	Cap.Ceramic	0. 01MF	N 50V
C231	24201470	Cap.Electrolytic	47MF	M 6. 3V
C232	24474103	Cap.Ceramic	0. 01MF	N 50V
C233	24474103	Cap.Ceramic	0. 01MF	N 50V
C234	24473390	Cap.Ceramic	39PF	J 50V
C235	24206478	Cap.Electrolytic	0. 47MF	M 50V
C238	24473470	Cap.Ceramic	47PF	J 50V
C239	24201220	Cap.Electrolytic	22MF	M 6. 3V
C240	24205479	Cap.Electrolytic	4. 7MF	M 35V
C241	24538474	Cap.Plastic	0. 47MF	J 50V
C242	24206010	Cap.Electrolytic	1MF	M 50V
C243	24203100	Cap.Electrolytic	10MF	M 16V
C244	24436331	Cap.Ceramic	330PF	J 50V
C245	24473430	Cap.Ceramic	43PF	J 50V
C246	24201470	Cap.Electrolytic	47MF	M 6. 3V
C247	24474102	Cap.Ceramic	1000PF	K 50V
C248	24474103	Cap.Ceramic	0. 01MF	N 50V
C249	24474103	Cap.Ceramic	0. 01MF	N 50V
C260	24474103	Cap.Ceramic	0. 01MF	N 50V
C261	24203470	Cap.Electrolytic	47MF	M 16V
C262	24474103	Cap.Ceramic	0. 01MF	N 50V

LOCATION NUMBER	P A R T NUMBER	DESCRIPTION		
C263	24474103	Cap.Ceramic	0. 01MF	N 50V
C264	24203470	Cap.Electrolytic	47MF	M 16V
C266	24474103	Cap.Ceramic	0. 01MF	N 50V
C267	24203470	Cap.Electrolytic	47MF	M 16V
C268	24206010	Cap.Electrolytic	1MF	M 50V
C269	24205479	Cap.Electrolytic	4. 7MF	M 35V
C270	24473390	Cap.Ceramic	39PF	J 50V
C271	24436101	Cap.Ceramic	100PF	J 50V
C272	244733270	Cap.Ceramic	27PF	J 50V
C273	24206478	Cap.Electrolytic	0. 47MF	M 50V
C274	24474103	Cap.Ceramic	0. 01MF	N 50V
C275	24474910	Cap.Ceramic	91PF	K 50V
C276	24201470	Cap.Electrolytic	47MF	M 6.3V
C277	24473680	Cap.Ceramic	68PF	J 50V
C278	24473680	Cap.Ceramic	68PF	J 50V
C279	24201220	Cap.Electrolytic	22MF	M 6.3V
C281	24474103	Cap.Ceramic	0. 01MF	N 50V
C282	24474103	Cap.Ceramic	0. 01MF	N 50V
C283	244733270	Cap.Ceramic	27PF	J 50V
C298	24436100	Cap.Ceramic	10PF	J 50V
C299	24474103	Cap.Ceramic	0. 01MF	N 50V
C301	24203220	Cap.Electrolytic	22MF	M 16V
C302	24203220	Cap.Electrolytic	22MF	M 16V
C303	24203220	Cap.Electrolytic	22MF	M 16V
C304	24203470	Cap.Electrolytic	47MF	M 16V
C305	24851223	Cap.Ceramic	0. 022MF	K 25V
C306	24203470	Cap.Electrolytic	47MF	M 16V
C307	24538104	Cap.Plastic	0. 1MF	J 50V
C308	24474102	Cap.Ceramic	1000PF	K 50V
C309	24793471	Cap.Electrolytic	470MF	M 10V
C310	24203470	Cap.Electrolytic	47MF	M 16V
C311	24203470	Cap.Electrolytic	47MF	M 16V
C312	24473360	Cap.Ceramic	36PF	J 50V
C313	24436181	Cap.Ceramic	180PF	J 50V
C315	24202101	Cap.Electrolytic	100MF	M 10V
C317	24203220	Cap.Electrolytic	22MF	M 16V
C322	24202101	Cap.Electrolytic	100MF	M 10V
C323	24201470	Cap.Electrolytic	47MF	M 6.3V
C324	24201470	Cap.Electrolytic	47MF	M 6.3V
C325	24206010	Cap.Electrolytic	1MF	M 50V
C326	24202101	Cap.Electrolytic	100MF	M 10V
C327	24474103	Cap.Ceramic	0. 01MF	N 50V
C328	24474103	Cap.Ceramic	0. 01MF	N 50V
C330	24474103	Cap.Ceramic	0. 01MF	N 50V
C401	24474103	Cap.Ceramic	0. 01MF	N 50V
C402	24474103	Cap.Ceramic	0. 01MF	N 50V
C403	24340470	Cap.Ceramic	47PF	J 50V
C404	244733270	Cap.Ceramic	27PF	J 50V
C405	24206010	Cap.Electrolytic	1MF	M 50V
C406	24474103	Cap.Ceramic	0. 01MF	N 50V
C407	24206010	Cap.Electrolytic	1MF	M 50V
C408	24851222	Cap.Ceramic	2200PF	K 25V
C409	24353390	Cap.Ceramic	39PF	J 50V
C410	24474103	Cap.Ceramic	0. 01MF	N 50V
C411	24353510	Cap.Ceramic	51PF	J 50V
C412	24201470	Cap.Electrolytic	47MF	M 6.3V
C413	24474103	Cap.Ceramic	0. 01MF	N 50V
C414	24436201	Cap.Ceramic	200PF	J 50V
C415	24206010	Cap.Electrolytic	1MF	M 50V
C416	24201470	Cap.Electrolytic	47MF	M 6.3V
C417	24201470	Cap.Electrolytic	47MF	M 6.3V
C419	24474103	Cap.Ceramic	0. 01MF	N 50V
C420	24474103	Cap.Ceramic	0. 01MF	N 50V
C421	24591472	Cap.Plastic	4700PF	J 50V
C422	24591272	Cap.Plastic	4700PF	J 50V
C423	24591272	Cap.Plastic	2700PF	J 50V
C424	24206010	Cap.Electrolytic	1MF	M 50V
C425	24201470	Cap.Electrolytic	47MF	M 6.3V
C426	24436821	Cap.Ceramic	820PF	J 50V
C427	24436331	Cap.Ceramic	330PF	J 50V
C428	24206010	Cap.Electrolytic	1MF	M 50V
C429	24474103	Cap.Ceramic	0. 01MF	N 50V
C430	24436220	Cap.Ceramic	22PF	J 50V
C431	24474103	Cap.Ceramic	0. 01MF	N 50V
C432	24538823	Cap.Plastic	0. 082MF	J 50V

LOCATION NUMBER	P A R T NUMBER	DESCRIPTION		
C433	24474103	Cap.Ceramic	0. 01MF	N 50V
C434	24474103	Cap.Ceramic	0. 01MF	N 50V
C435	24201470	Cap.Electrolytic	47MF	M 6.3V
C436	24206010	Cap.Electrolytic	1MF	M 50V
C437	24436101	Cap.Ceramic	100PF	J 50V
C438	24474103	Cap.Ceramic	0. 01MF	N 50V
C439	24205479	Cap.Electrolytic	4. 7MF	M 35V
C440	24474103	Cap.Ceramic	0. 01MF	N 50V
C441	24474103	Cap.Ceramic	0. 01MF	N 50V
C442	24473180	Cap.Ceramic	18PF	J 50V
C443	24474821	Cap.Ceramic	820PF	K 50V
C444	24232223	Cap.Ceramic	0. 022MF	Z 50V
C445	24202101	Cap.Electrolytic	100MF	M 10V
C446	24436331	Cap.Ceramic	330PF	J 50V
C447	24436271	Cap.Ceramic	270PF	J 50V
C448	24203100	Cap.Electrolytic	10MF	M 16V
C460	24201470	Cap.Electrolytic	47MF	M 6.3V
C461	24436510	Cap.Ceramic	51PF	J 50V
C501	24203470	Cap.Electrolytic	47MF	M 16V
C502	24591103	Cap.Plastic	0. 01MF	J 50V
C503	24591222	Cap.Plastic	2200PF	J 50V
C504	24203470	Cap.Electrolytic	47MF	M 16V
C505	24206229	Cap.Electrolytic	2. 2MF	M 50V
C506	24538224	Cap.Plastic	0. 22MF	J 50V
C507	24232103	Cap.Ceramic	0. 01MF	Z 50V
C508	24617993	Cap.Electrolytic	1MF	M 50V
C509	24232103	Cap.Ceramic	0. 01MF	Z 50V
C510	24591103	Cap.Plastic	0. 01MF	J 50V
C511	24203100	Cap.Electrolytic	10MF	M 16V
C512	24232103	Cap.Ceramic	0. 01MF	Z 50V
C513	24203470	Cap.Electrolytic	47MF	M 16V
C514	24591223	Cap.Plastic	0. 022MF	J 50V
C515	24203470	Cap.Electrolytic	47MF	M 16V
C517	24591184	Cap.Plastic	0. 18MF	J 50V
C518	24538124	Cap.Plastic	0. 12MF	J 50V
C519	24591683	Cap.Plastic	0. 068MF	J 50V
C521	24591563	Cap.Plastic	0. 053MF	J 50V
C522	24591753	Cap.Plastic	0. 075MF	J 50V
C523	24591103	Cap.Plastic	0. 01MF	J 50V
C524	24232103	Cap.Ceramic	0. 01MF	Z 50V
C525	24203100	Cap.Electrolytic	10MF	M 16V
C526	24591103	Cap.Plastic	0. 01MF	J 50V
C527	24617993	Cap.Electrolytic	1MF	M 50V
C528	24206478	Cap.Electrolytic	0. 47MF	M 50V
C530	24203220	Cap.Electrolytic	22MF	M 16V
C531	24232103	Cap.Ceramic	0. 01MF	Z 50V
C532	24203100	Cap.Electrolytic	10MF	M 16V
C533	24203220	Cap.Electrolytic	22MF	M 16V
C537	24203470	Cap.Electrolytic	47MF	M 16V
C538	24436101	Cap.Ceramic	100PF	J 50V
C539	24203100	Cap.Electrolytic	10MF	M 16V
C540	24591102	Cap.Plastic	1000PF	J 50V
C541	24591473	Cap.Plastic	0. 047MF	J 50V
C542	24212102	Cap.Ceramic	1000PF	K 50V
C543	24591222	Cap.Plastic	2200PF	J 50V
C544	24232103	Cap.Ceramic	0. 01MF	Z 50V
C545	24436121	Cap.Ceramic	120PF	J 50V
C546	24538274	Cap.Plastic	0. 27MF	J 50V
C547	24203220	Cap.Electrolytic	22MF	M 16V
C548	24232103	Cap.Ceramic	0. 01MF	Z 50V
C549	24232103	Cap.Ceramic	0. 01MF	Z 50V
C550	24232103	Cap.Ceramic	0. 01MF	Z 50V
C551	24232103	Cap.Ceramic	0. 01MF	Z 50V
C560	24232103	Cap.Ceramic	0. 01MF	Z 50V
C601	24201470	Cap.Electrolytic	47MF	M 6.3V
C602	24232103	Cap.Ceramic	0. 01MF	Z 50V
C604	24436330	Cap.Ceramic	33PF	J 50V
C605	24436330	Cap.Ceramic	33PF	J 50V
C606	24203101	Cap.Electrolytic	100MF	M 16V
C608	24794470	Cap.Electrolytic	47MF	M 16V
C609	24203470	Cap.Electrolytic	47MF	M 16V
C610	24204470	Cap.Electrolytic	47MF	M 25V
C611	24205100	Cap.Electrolytic	10MF	M 35V
C612	24232103	Cap.Ceramic	0. 01MF	Z 50V
C613	24232103	Cap.Ceramic	0. 01MF	Z 50V

LOCATION NUMBER	PART NUMBER	DESCRIPTION			LOCATION NUMBER	PART NUMBER	DESCRIPTION		
C614	24232103	Cap.Ceramic	0. 01MF	Z 50V	R246	24366222	Res.Carbon	2. 2K	J 1/6W
C615	24232223	Cap.Ceramic	0. 022MF	Z 50V	R247	24366101	Res.Carbon	100	J 1/6W
C616	24232223	Cap.Ceramic	0. 022MF	Z 50V	R248	24366272	Res.Carbon	2. 7K	J 1/6W
C617	24232223	Cap.Ceramic	0. 022MF	Z 50V	R249	24366681	Res.Carbon	680	J 1/6W
C618	24232223	Cap.Ceramic	0. 022MF	Z 50V	R251	24066951	Res.Variable	20K	
C621	24793221	Cap.Electrolytic	220MF	M 10V	R252	24066952	Res.Variable	10K	
C622	24206108	Cap.Electrolytic	0.1MF	M 50V	R253	24066952	Res.Variable	10K	
C625	24206478	Cap.Electrolytic	0. 47MF	M 50V	R254	24066952	Res.Variable	10K	
C629	24794470	Cap.Electrolytic	47MF	M 16V	R255	24066957	Res.Variable	200	
C698	24206479	Cap.Electrolytic	4. 7MF	M 50V	R256	24066954	Res.Variable	2K	
C699	24232223	Cap.Ceramic	0. 022MF	Z 50V	R257	24066952	Res.Variable	10K	
CD99	24474102	Cap.Ceramic	1000PF	K 50V	R261	24366122	Res.Carbon	1. 2K	J 1/6W
RESISTORS					R262	24366392	Res.Carbon	3. 9K	J 1/6W
R138	24366821	Res.Carbon	820	J 1/6W	R263	24366203	Res.Carbon	20K	J 1/6W
R139	24366102	Res.Carbon	1K	J 1/6W	R264	24366621	Res.Carbon	620	J 1/6W
R140	24366103	Res.Carbon	10K	J 1/6W	R265	24366751	Res.Carbon	750	J 1/6W
R141	24366272	Res.Carbon	2. 7K	J 1/6W	R266	24000952	Res.Thermistor	3K	
R142	24366272	Res.Carbon	2. 7K	J 1/6W	R268	24366102	Res.Carbon	1K	J 1/6W
R146	24366271	Res.Carbon	270	J 1/6W	R269	24366102	Res.Carbon	1K	J 1/6W
R147	24366102	Res.Carbon	1K	J 1/6W	R270	24366561	Res.Carbon	560	J 1/6W
R148	24366102	Res.Carbon	1K	J 1/6W	R271	24366561	Res.Carbon	560	J 1/6W
R160	24366471	Res.Carbon	470	J 1/6W	R272	24366153	Res.Carbon	15K	J 1/6W
R161	24366151	Res.Carbon	150	J 1/6W	R273	24366103	Res.Carbon	10K	J 1/6W
R162	24366471	Res.Carbon	470	J 1/6W	R274	24366471	Res.Carbon	470	J 1/6W
R163	24366471	Res.Carbon	470	J 1/6W	R275	24366681	Res.Carbon	680	J 1/6W
R164	24366102	Res.Carbon	1K	J 1/6W	R276	24366222	Res.Carbon	2. 2K	J 1/6W
R165	24366821	Res.Carbon	820	J 1/6W	R277	24366102	Res.Carbon	1K	J 1/6W
R166	24366102	Res.Carbon	1K	J 1/6W	R278	24366102	Res.Carbon	1K	J 1/6W
R167	24366102	Res.Carbon	1K	J 1/6W	R279	24366470	Res.Carbon	47	J 1/6W
R168	24366102	Res.Carbon	1K	J 1/6W	R280	24366681	Res.Carbon	680	J 1/6W
R169	24366751	Res.Carbon	750	J 1/6W	R281	24366392	Res.Carbon	3. 9K	J 1/6W
R170	24366152	Res.Carbon	1. 5K	J 1/6W	R283	24366821	Res.Carbon	820	J 1/6W
R201	24366103	Res.Carbon	10K	J 1/6W	R288	24366155	Res.Carbon	1. 5M	J 1/6W
R202	24366103	Res.Carbon	10K	J 1/6W	R299	24360222	Res.Carbon	2. 2K	J 1/8W
R203	24366332	Res.Carbon	3. 3K	J 1/6W	R301	24366102	Res.Carbon	1K	J 1/6W
R204	24366331	Res.Carbon	330	J 1/6W	R302	24366102	Res.Carbon	1K	J 1/6W
R205	24366272	Res.Carbon	2. 7K	J 1/6W	R306	24366472	Res.Carbon	4. 7K	J 1/6W
R206	24366332	Res.Carbon	3. 3K	J 1/6W	R307	24366750	Res.Carbon	75	J 1/6W
R207	24366331	Res.Carbon	330	J 1/6W	R308	24376271	Res.Carbon	270	J 1/2W
R208	24366621	Res.Carbon	620	J 1/6W	R309	24366243	Res.Carbon	24K	J 1/6W
R209	24366274	Res.Carbon	270K	J 1/6W	R311	24366222	Res.Carbon	2. 2K	J 1/6W
R210	24366302	Res.Carbon	3K	J 1/6W	R312	24366824	Res.Carbon	820K	J 1/6W
R211	24366823	Res.Carbon	82K	J 1/6W	R313	24360203	Res.Carbon	20K	J 1/8W
R212	24366624	Res.Carbon	620K	J 1/6W	R314	24366750	Res.Carbon	75	J 1/6W
R213	24366681	Res.Carbon	680	J 1/6W	R315	24366182	Res.Carbon	1. 8K	J 1/6W
R214	24366121	Res.Carbon	120	J 1/6W	R316	24366102	Res.Carbon	1K	J 1/6W
R215	24366564	Res.Carbon	560K	J 1/6W	R317	24366102	Res.Carbon	1K	J 1/6W
R216	24366474	Res.Carbon	470K	J 1/6W	R318	24366102	Res.Carbon	1K	J 1/6W
R217	24366821	Res.Carbon	820	J 1/6W	R319	24366472	Res.Carbon	4. 7K	J 1/6W
R218	24366362	Res.Carbon	3. 6K	J 1/6W	R320	24366152	Res.Carbon	1. 5K	J 1/6W
R219	24376752	Res.Carbon	7. 5K	J 1/2W	R321	24366182	Res.Carbon	1. 8K	J 1/6W
R220	24366273	Res.Carbon	27K	J 1/6W	R322	24366103	Res.Carbon	10K	J 1/6W
R221	24366513	Res.Carbon	51K	J 1/6W	R323	24366122	Res.Carbon	1. 2K	J 1/6W
R222	24366683	Res.Carbon	68K	J 1/6W	R324	24366471	Res.Carbon	470	J 1/6W
R223	24366103	Res.Carbon	10K	J 1/6W	R325	24366562	Res.Carbon	5. 6K	J 1/6W
R224	24366332	Res.Carbon	3. 3K	J 1/6W	R326	24366162	Res.Carbon	1. 6K	J 1/6W
R225	24366472	Res.Carbon	4. 7K	J 1/6W	R327	24366112	Res.Carbon	1. 1K	J 1/6W
R226	24366155	Res.Carbon	1. 5M	J 1/6W	R333	24366102	Res.Carbon	1K	J 1/6W
R227	24366152	Res.Carbon	1. 5K	J 1/6W	R340	24366221	Res.Carbon	220	J 1/6W
R228	24366152	Res.Carbon	1. 5K	J 1/6W	R342	24366821	Res.Carbon	820	J 1/6W
R229	24366821	Res.Carbon	820	J 1/6W	R343	24366105	Res.Carbon	1M	J 1/6W
R230	24366474	Res.Carbon	470K	J 1/6W	R344	24366472	Res.Carbon	4. 7K	J 1/6W
R231	24366124	Res.Carbon	120K	J 1/6W	R345	24366102	Res.Carbon	1K	J 1/6W
R232	24366222	Res.Carbon	2. 2K	J 1/6W	R346	24366102	Res.Carbon	1K	J 1/6W
R235	24366223	Res.Carbon	22K	J 1/6W	R347	24366162	Res.Carbon	1. 6K	J 1/6W
R236	24366223	Res.Carbon	22K	J 1/6W	R348	24366181	Res.Carbon	180	J 1/6W
R237	24380132	Res.Carbon	1. 3K	J 1/8W	R349	24366750	Res.Carbon	75	J 1/6W
R238	24366821	Res.Carbon	820	J 1/6W	R351	24066956	Res.Variable	500	
R239	24366222	Res.Carbon	2. 2K	J 1/6W	R352	24366332	Res.Carbon	3. 3K	J 1/6W
R240	24366132	Res.Carbon	1. 3K	J 1/6W	R401	24366750	Res.Carbon	75	J 1/6W
R241	24366222	Res.Carbon	2. 2K	J 1/6W	R402	24366272	Res.Carbon	2. 7K	J 1/6W
R242	24366102	Res.Carbon	1K	J 1/6W	R403	24366470	Res.Carbon	47	J 1/6W
R243	24366471	Res.Carbon	470	J 1/6W	R404	24366392	Res.Carbon	3. 9K	J 1/6W
R244	24366681	Res.Carbon	680	J 1/6W	R405	24366103	Res.Carbon	10K	J 1/6W
R245	24366202	Res.Carbon	2K	J 1/6W	R406	24366222	Res.Carbon	2. 2K	J 1/6W

LOCATION NUMBER	P A R T NUMBER	DESCRIPTION			LOCATION NUMBER	P A R T NUMBER	DESCRIPTION		
R407	24366202	Res. Carbon	2K	J 1/6W	R533	24366912	Res. Carbon	9. 1K	J 1/6W
R408	24366333	Res. Carbon	33K	J 1/6W	R534	24366103	Res. Carbon	10K	J 1/6W
R409	24366302	Res. Carbon	3K	J 1/6W	R535	24366820	Res. Carbon	82	J 1/6W
R410	24366472	Res. Carbon	4. 7K	J 1/6W	R536	24366752	Res. Carbon	7. 5K	J 1/6W
R411	24366103	Res. Carbon	10K	J 1/6W	R537	24366103	Res. Carbon	10K	J 1/6W
R412	24366101	Res. Carbon	100	J 1/6W	R538	24366472	Res. Carbon	4. 7K	J 1/6W
R413	24366122	Res. Carbon	1. 2K	J 1/6W	R539	24366472	Res. Carbon	4. 7K	J 1/6W
R414	24366470	Res. Carbon	47	J 1/6W	R540	24366472	Res. Carbon	4. 7K	J 1/6W
R415	24366751	Res. Carbon	750	J 1/6W	R541	24366473	Res. Carbon	47K	J 1/6W
R416	24366750	Res. Carbon	75	J 1/6W	R542	24366512	Res. Carbon	5. 1K	J 1/6W
R417	24366750	Res. Carbon	75	J 1/6W	R544	24366512	Res. Carbon	5. 1K	J 1/6W
R418	24366750	Res. Carbon	75	J 1/6W	R545	24366512	Res. Carbon	5. 1K	J 1/6W
R419	24366332	Res. Carbon	3. 3K	J 1/6W	R547	24366364	Res. Carbon	360K	J 1/6W
R420	24366332	Res. Carbon	3. 3K	J 1/6W	R548	24366472	Res. Carbon	4. 7K	J 1/6W
R421	24366332	Res. Carbon	3. 3K	J 1/6W	R549	24366621	Res. Carbon	620	J 1/6W
R422	24366224	Res. Carbon	220K	J 1/6W	R551	24066896	Res. Variable	500K	
R423	24366103	Res. Carbon	10K	J 1/6W	R552	24066896	Res. Variable	500K	
R424	24366103	Res. Carbon	10K	J 1/6W	R553	24061664	Res. Variable	200K	
R425	24366222	Res. Carbon	2. 2K	J 1/6W	R555	24066948	Res. Variable	200K	
R426	24366471	Res. Carbon	470	J 1/6W	R557	24066946	Res. Variable	1M	
R427	24366472	Res. Carbon	4. 7K	J 1/6W	R558	24066947	Res. Variable	500K	
R428	24366102	Res. Carbon	1K	J 1/6W	R559	24066914	Res. Variable	5K	
R429	24366331	Res. Carbon	330	J 1/6W	R560	24366222	Res. Carbon	2. 2K	J 1/6W
R430	24366222	Res. Carbon	2. 2K	J 1/6W	R561	24366472	Res. Carbon	4. 7K	J 1/6W
R431	24366132	Res. Carbon	1. 3K	J 1/6W	R562	24366221	Res. Carbon	220	J 1/6W
R432	24366103	Res. Carbon	10K	J 1/6W	R563	24366333	Res. Carbon	33K	J 1/6W
R433	24366103	Res. Carbon	10K	J 1/6W	R564	24366752	Res. Carbon	7. 5K	J 1/6W
R434	24366102	Res. Carbon	1K	J 1/6W	R565	24366363	Res. Carbon	36K	J 1/6W
R435	24366102	Res. Carbon	1K	J 1/6W	R566	24366274	Res. Carbon	270K	J 1/6W
R436	24366102	Res. Carbon	1K	J 1/6W	R567	24366123	Res. Carbon	12K	J 1/6W
R437	24366102	Res. Carbon	1K	J 1/6W	R568	24366203	Res. Carbon	20K	J 1/6W
R438	24366561	Res. Carbon	560	J 1/6W	R569	24366123	Res. Carbon	12K	J 1/6W
R439	24366132	Res. Carbon	1. 3K	J 1/6W	R570	24366113	Res. Carbon	11K	J 1/6W
R440	24366121	Res. Carbon	120	J 1/6W	R571	24366221	Res. Carbon	220	J 1/6W
R441	24366181	Res. Carbon	180	J 1/6W	R572	24366224	Res. Carbon	220K	J 1/6W
R442	24366471	Res. Carbon	470	J 1/6W	R573	24366222	Res. Carbon	2. 2K	J 1/6W
R443	24366820	Res. Carbon	82	J 1/6W	R574	24366472	Res. Carbon	4. 7K	J 1/6W
R445	24366333	Res. Carbon	33K	J 1/6W	R575	24366472	Res. Carbon	4. 7K	J 1/6W
R451	24066955	Res. Variable	1K		R576	24366364	Res. Carbon	360K	J 1/6W
R454	24066955	Res. Variable	1K		R577	24366132	Res. Carbon	1. 3K	J 1/6W
R455	24066948	Res. Variable	200K		R578	24366133	Res. Carbon	13K	J 1/6W
R462	24366224	Res. Carbon	220K	J 1/6W	R579	24366153	Res. Carbon	15K	J 1/6W
R463	24366224	Res. Carbon	220K	J 1/6W	R581	24366202	Res. Carbon	2K	J 1/6W
R466	24366221	Res. Carbon	220	J 1/6W	R582	24366102	Res. Carbon	1K	J 1/6W
R467	24366152	Res. Carbon	1. 5K	J 1/6W	R583	24366221	Res. Carbon	220	J 1/6W
R468	24366821	Res. Carbon	820	J 1/6W	R584	24366105	Res. Carbon	1M	J 1/6W
R469	24366152	Res. Carbon	1. 5K	J 1/6W	R585	24366473	Res. Carbon	47K	J 1/6W
R501	24366104	Res. Carbon	100K	J 1/6W	R586	24366153	Res. Carbon	15K	J 1/6W
R502	24366823	Res. Carbon	82K	J 1/6W	R587	24366153	Res. Carbon	15K	J 1/6W
R503	24366334	Res. Carbon	330K	J 1/6W	R588	24366334	Res. Carbon	330K	J 1/6W
R504	24366334	Res. Carbon	330K	J 1/6W	R589	24366162	Res. Carbon	1. 6K	J 1/6W
R505	24366134	Res. Carbon	130K	J 1/6W	R590	24366272	Res. Carbon	2. 7K	J 1/6W
R506	24366223	Res. Carbon	22K	J 1/6W	R591	24366204	Res. Carbon	200K	J 1/6W
R507	24366223	Res. Carbon	22K	J 1/6W	R593	24366562	Res. Carbon	5. 6K	J 1/6W
R508	24366472	Res. Carbon	4. 7K	J 1/6W	R594	24366332	Res. Carbon	3. 3K	J 1/6W
R509	24366472	Res. Carbon	4. 7K	J 1/6W	R595	24366473	Res. Carbon	47K	J 1/6W
R510	24366184	Res. Carbon	180K	J 1/6W	R596	24366104	Res. Carbon	100K	J 1/6W
R511	24366633	Res. Carbon	68K	J 1/6W	R597	24366473	Res. Carbon	47K	J 1/6W
R512	24366105	Res. Carbon	1M	J 1/6W	R598	24366392	Res. Carbon	3. 9K	J 1/6W
R513	24366104	Res. Carbon	100K	J 1/6W	R599	24366473	Res. Carbon	47K	J 1/6W
R514	24366472	Res. Carbon	4. 7K	J 1/6W	R607	24366101	Res. Carbon	100	J 1/6W
R515	24366473	Res. Carbon	47K	J 1/6W	R609	24366103	Res. Carbon	10K	J 1/6W
R516	24366473	Res. Carbon	47K	J 1/6W	R610	24366332	Res. Carbon	3. 3K	J 1/6W
R517	24366272	Res. Carbon	2. 7K	J 1/6W	R611	24366103	Res. Carbon	10K	J 1/6W
R518	24366472	Res. Carbon	4. 7K	J 1/6W	R612	24366103	Res. Carbon	10K	J 1/6W
R521	24941275	Res. Composition	2. 7M	J 1/4W	R613	24366103	Res. Carbon	10K	J 1/6W
R522	24366472	Res. Carbon	4. 7K	J 1/6W	R614	24366103	Res. Carbon	10K	J 1/6W
R523	24366472	Res. Carbon	4. 7K	J 1/6W	R615	24366103	Res. Carbon	10K	J 1/6W
R524	24366163	Res. Carbon	16K	J 1/6W	R616	24366103	Res. Carbon	10K	J 1/6W
R525	24366204	Res. Carbon	200K	J 1/6W	R617	24366103	Res. Carbon	10K	J 1/6W
R526	24366204	Res. Carbon	200K	J 1/6W	R618	24366103	Res. Carbon	10K	J 1/6W
R527	24366163	Res. Carbon	16K	J 1/6W	R619	24366472	Res. Carbon	4. 7K	J 1/6W
R528	24366512	Res. Carbon	5. 1K	J 1/6W	R620	24366103	Res. Carbon	10K	J 1/6W
R529	24366104	Res. Carbon	100K	J 1/6W	R621	24366472	Res. Carbon	4. 7K	J 1/6W
R532	24366104	Res. Carbon	100K	J 1/6W	R622	24366472	Res. Carbon	4. 7K	J 1/6W

LOCATION NUMBER	P A R T NUMBER	D E S C R I P T I O N				LOCATION NUMBER	P A R T NUMBER	D E S C R I P T I O N			
R623	24366472	Res. Carbon	4. 7K	J 1/6W		RY04	24366472	Res. Carbon	4. 7K	J 1/6W	
R624	24366472	Res. Carbon	4. 7K	J 1/6W		RY05	24366472	Res. Carbon	4. 7K	J 1/6W	
R625	24366472	Res. Carbon	4. 7K	J 1/6W		RY06	24366472	Res. Carbon	4. 7K	J 1/6W	
R626	24366124	Res. Carbon	120K	J 1/6W		RY07	24366244	Res. Carbon	240K	J 1/6W	
R627	24366124	Res. Carbon	120K	J 1/6W		RY08	24366563	Res. Carbon	56K	J 1/6W	
R628	24366102	Res. Carbon	1K	J 1/6W		RY09	24366682	Res. Carbon	6. 8K	J 1/6W	
R629	24366822	Res. Carbon	8. 2K	J 1/6W		RY14	24366223	Res. Carbon	22K	J 1/6W	
R630	24366151	Res. Carbon	150	J 1/6W		RY15	24366105	Res. Carbon	1M	J 1/6W	
R631	24366103	Res. Carbon	10K	J 1/6W		RY17	24366474	Res. Carbon	470K	J 1/6W	
R632	24366102	Res. Carbon	1K	J 1/6W		RY18	24366224	Res. Carbon	220K	J 1/6W	
R633	24366103	Res. Carbon	10K	J 1/6W		RY19	24366224	Res. Carbon	220K	J 1/6W	
R634	24366103	Res. Carbon	10K	J 1/6W		RY20	24366394	Res. Carbon	390K	J 1/6W	
R635	24366103	Res. Carbon	10K	J 1/6W		RY21	24366473	Res. Carbon	47K	J 1/6W	
R636	24366472	Res. Carbon	4. 7K	J 1/6W		RY31	24366101	Res. Carbon	100	J 1/6W	
R637	24366472	Res. Carbon	4. 7K	J 1/6W		RY33	24366393	Res. Carbon	39K	J 1/6W	
R638	24366472	Res. Carbon	4. 7K	J 1/6W		RY34	24366103	Res. Carbon	10K	J 1/6W	
R639	24366102	Res. Carbon	1K	J 1/6W		RY35	24366223	Res. Carbon	22K	J 1/6W	
R640	24366182	Res. Carbon	1. 8K	J 1/6W		RY36	24366104	Res. Carbon	100K	J 1/6W	
R641	24366101	Res. Carbon	100	J 1/6W		RY38	24366914	Res. Carbon	910K	J 1/6W	
R642	24366561	Res. Carbon	560	J 1/6W		RY98	24366103	Res. Carbon	10K	J 1/6W	
R643	24982399	Res. Metal	3. 9	J 1/2W		RY99	24366473	Res. Carbon	47K	J 1/6W	
R645	24367272	Res. Carbon	2.7K	G 1/8W		M I S C E L L A N E O U S					
R646	24367302	Res. Carbon	3K	G 1/6W		H002	70123096	RF Modulator, MSU112			
R647	24367331	Res. Carbon	330	G 1/6W		P209	23365208	Phono Jack			
R648	24367162	Res. Carbon	1. 8K	G 1/6W		Q516B	70391355	Screw, 3x8mm			
R649	24366152	Res. Carbon	1. 5K	J 1/6W		Q517A	23721308	Screw, 3x8mm			
R651	24066952	Res. Variable	10K			Q625B	70391355	Screw, 3x8mm			
R652	24066954	Res. Variable	2K			S101	23145395	Slide Switch, 1C3P			
R653	24066952	Res. Variable	10K			S202	23145396	Slide Switch, 1C3P			
R660	24366473	Res. Carbon	47K	J 1/6W		V502	70391334	Screw, 3x8mm			
R661	24366392	Res. Carbon	3. 9K	J 1/6W		X401	70138078	1H Delay			
R663	24366103	Res. Carbon	10K	J 1/6W		X402	70153037	Crystal, 3. 58MHz			
R664	24366103	Res. Carbon	10K	J 1/6W		X601	23153847	Resonator, 4MHz, TCR1014			
R665	24366334	Res. Carbon	330K	J 1/6W		Z201	23107731	Filter, TLC1090			
R666	24366334	Res. Carbon	330K	J 1/6W		Z401	23107807	Filter, TLC1062, 3. 58MHz			
R667	24366332	Res. Carbon	3. 3K	J 1/6W		Z601	24000916	Resistor Block, 4. 7K x4			
R668	24366432	Res. Carbon	4. 3K	J 1/6W		Z801	23107728	DC-DC Converter			
R669	24366472	Res. Carbon	4. 7K	J 1/6W							
R670	24366561	Res. Carbon	560	J 1/6W		UM02	70197159	P C Board Assy, F/I, L			
R671	24366561	Res. Carbon	560	J 1/6W		C A P A C I T O R S					
R673	24366103	Res. Carbon	10K	J 1/6W		CM21	24232103	Cap. Ceramic	0. 01MF	Z 50V	
R675	24366103	Res. Carbon	10K	J 1/6W							
R676	24366103	Res. Carbon	10K	J 1/6W		UM03	70197158	P C Board Assy, F/I, R			
R679	24366472	Res. Carbon	4. 7K	J 1/6W		C A P A C I T O R S					
R680	24366472	Res. Carbon	4. 7K	J 1/6W		CM31	24232103	Cap. Ceramic	0. 01MF	Z 50V	
R681	24366152	Res. Carbon	1. 5K	J 1/6W							
R682	24366681	Res. Carbon	680	J 1/6W		UM04	70194602	P C Board Assy, Reel. Sensor (S)			
R683	24366151	Res. Carbon	150	J 1/6W							
R684	24366682	Res. Carbon	6. 8K	J 1/6W		UM05	70194603	P C Board Assy, Reel. Sensor (T)			
R685	24366103	Res. Carbon	10K	J 1/6W							
R686	24366102	Res. Carbon	1K	J 1/6W		UM07	70197151	P C Board Assy, ACE Head			
R687	24366101	Res. Carbon	100	J 1/6W		R E S I S T O R S					
R688	24366101	Res. Carbon	100	J 1/6W		RM71	24366100	Res. Carbon	10	J 1/6W	
R689	24366103	Res. Carbon	10K	J 1/6W							
R691	24366201	Res. Carbon	200	J 1/6W		UM08	70194606	P C Board Assy, Loading Motor			
R692	24366102	Res. Carbon	1K	J 1/6W							
R695	24366472	Res. Carbon	4. 7K	J 1/6W		U301	70197319	P C Board Assy, Sub Video			
R696	24366103	Res. Carbon	10K	J 1/6W		T R A N S I S T O R S					
R697	24366103	Res. Carbon	10K	J 1/6W		Q370	A6332540	Transistor	2SC2668-Y		
R698	24366103	Res. Carbon	10K	J 1/6W		Q371	A6332430	Transistor	2SC2458-Y		
R699	24366103	Res. Carbon	10K	J 1/6W		Q374	A6534430	Transistor	2SA1048-Y		
RD99	24366753	Res. Carbon	75K	J 1/6W		Q375	A6534430	Transistor	2SA1048-Y		
RL69	24366221	Res. Carbon	220	J 1/6W		D I O D E S					
RL89	24366102	Res. Carbon	1K	J 1/6W		D370	A7151500	Diode	1SS201		
RL91	24366103	Res. Carbon	10K	J 1/6W		C A P A C I T O R S					
RL92	24366103	Res. Carbon	10K	J 1/6W		C370	24436181	Cap. Ceramic	180PF	J 50V	
RL94	24366512	Res. Carbon	5. 1K	J 1/6W		C372	24206010	Cap. Electrolytic	1MF	M 50V	
RL95	24366101	Res. Carbon	100	J 1/6W		C373	24206010	Cap. Electrolytic	1MF	M 50V	
RL96	24366103	Res. Carbon	10K	J 1/6W		C374	24474103	Cap. Ceramic	0. 01MF	N 50V	
RL97	24366472	Res. Carbon	4. 7K	J 1/6W		C376	24473680	Cap. Ceramic	68PF	J 50V	
RL98	24366102	Res. Carbon	1K	J 1/6W		C377	24201470	Cap. Electrolytic	47MF	M 6.3V	
RL99	24366102	Res. Carbon	1K	J 1/6W		R E S I S T O R S					
RY01	24366133	Res. Carbon	13K	J 1/6W		R370	24366391	Res. Carbon	390	J 1/6W	
RY02	24366624	Res. Carbon	620K	J 1/6W		R371	24366332	Res. Carbon	3. 3K	J 1/6W	
RY03	24366222	Res. Carbon	2. 2K	J 1/6W		R372	24366222	Res. Carbon	2. 2K	J 1/6W	

LOCATION NUMBER	P A R T NUMBER	DESCRIPTION			
R373	24366102	Res.Carbon	1K	J 1/6W	
R374	24366472	Res.Carbon	4. 7K	J 1/6W	
R375	24366242	Res.Carbon	2. 4K	J 1/6W	
R377	24366102	Res.Carbon	1K	J 1/6W	
R378	24366102	Res.Carbon	1K	J 1/6W	
R379	24366103	Res.Carbon	10K	J 1/6W	
R381	24366361	Res.Carbon	360	J 1/6W	
R382	24366432	Res.Carbon	4. 3K	J 1/6W	
R383	24366152	Res.Carbon	1. 5K	J 1/6W	
R384	24366222	Res.Carbon	2. 2K	J 1/6W	
R385	24366103	Res.Carbon	10K	J 1/6W	
R386	24366103	Res.Carbon	10K	J 1/6W	
R387	24366222	Res.Carbon	2. 2K	J 1/6W	
M I S C E L L A N E O U S					
P402	23367026	Plug.3P			
U802 70197358 P C Board Assy.Power 1					
T R A N S I S T O R S					
Q808	70114344	Transistor	2SD1198A-Q		
D I O D E S					
ΔD801	23118977	Diode	ERC01-02FL		
ΔD802	23118977	Diode	ERC01-02FL		
ΔD803	23118977	Diode	ERC01-02FL		
ΔD804	23118977	Diode	ERC01-02FL		
D806	A7682052	Diode	1B2Z1		
C A P A C I T O R S					
ΔC801	24092009	Cap.Ceramic	100PF	Z 125V	
C802	24538223	Cap.Plastic	0. 022MF	J 50V	
C803	24538223	Cap.Plastic	0. 022MF	J 50V	
ΔC804	24086973	Cap.Electrolytic	6800MF	M 35V	
ΔC805	24794332	Cap.Electrolytic	3300MF	M 16V	
C806	24794101	Cap.Electrolytic	100MF	M 16V	
C808	24795102	Cap.Electrolytic	1000MF	M 25V	
C809	24538224	Cap.Plastic	0. 22MF	J 50V	
R E S I S T O R S					
ΔR801	24942335	Res.Composition	3. 3M	J 1/2W	
R802	24552511	Res.Oxide Metal	510	J 1/2W	
R803	24366201	Res.Carbon	200	J 1/6W	
R804	24366104	Res.Carbon	100K	J 1/6W	
R805	24366103	Res.Carbon	10K	J 1/6W	
ΔR806	24556159	Res.Fusible	1. 5	K 1/2W	
M I S C E L L A N E O U S					
ΔF801	23144929	Fuse.1. 2A			
ΔF801A	23165081	Fuse Holder			
ΔF802	23144897	Fuse.125V. 2. 0A			
ΔF802A	23165102	Fuse Holder			
ΔF803	23144911	Fuse.1. 2A			
ΔF803A	23165102	Fuse Holder			
U803 70197359 P C Board Assy.Power 2					
I N T E G R A T E D C I R C U I T S					
IC801	70135077	IC	STK7241		
IC802	70119512	IC	LA6324		
IC805	23314140	IC	STA342M		
T R A N S I S T O R S					
Q806	A6332430	Transistor	2SC2458-Y		
Q807	A6002010	Transistor	RN1201		
Q809	A6533240	Transistor	2SA966-Y		
Q810	A6533240	Transistor	2SA966-Y		
Q811	A6867970	Transistor	2SD1405-BL		
Q812	A6332430	Transistor	2SC2458-Y		
Q813	A6002010	Transistor	RN1201		
D I O D E S					
D805	70115408	Diode	EQAQ02-05D		
D807	A7246711	Diode	1S1555(TV)		
D811	A7151450	Diode	1SS200		
C O I L S					
L801	23103961	Coil.Choke	2BF253D-01		
L802	23221948	Coil.Choke	TLN3030		
L803	23103961	Coil.Choke	2BF253D-01		
L804	23103961	Coil.Choke	2BF253D-01		
C A P A C I T O R S					
C810	24203220	Cap.Electrolytic	22MF	M 16V	
C811	24206010	Cap.Electrolytic	1MF	M 50V	
C812	24794221	Cap.Electrolytic	220MF	M 16V	

LOCATION NUMBER	P A R T NUMBER	DESCRIPTION			
C813	24794102	Cap.Electrolytic	1000MF	M 16V	
C814	24232103	Cap.Ceramic	0. 01MF	Z 50V	
C815	24203220	Cap.Electrolytic	22MF	M 16V	
C816	24203220	Cap.Electrolytic	22MF	M 16V	
C817	24203220	Cap.Electrolytic	22MF	M 16V	
C818	24203220	Cap.Electrolytic	22MF	M 16V	
R E S I S T O R S					
R807	24380822	Res.Carbon	8. 2K	J 1/8W	
R810	24367242	Res.Carbon	2. 4K	G 1/6W	
R811	24367302	Res.Carbon	3K	G 1/6W	
R812	24366102	Res.Carbon	1K	J 1/6W	
R813	24366202	Res.Carbon	2K	J 1/6W	
R815	24366270	Res.Carbon	27	J 1/6W	
R816	24366301	Res.Carbon	300	J 1/6W	
R817	24366301	Res.Carbon	300	J 1/6W	
R818	24366103	Res.Carbon	10K	J 1/6W	
R820	24552391	Res.Oxide Metal	390	J 1/2W	
R821	24366102	Res.Carbon	1K	J 1/6W	
R822	24366431	Res.Carbon	430	J 1/6W	
R823	24366301	Res.Carbon	300	J 1/6W	
R824	24366102	Res.Carbon	1K	J 1/6W	
R825	24360362	Res.Carbon	3. 6K	J 1/8W	
R826	24366301	Res.Carbon	300	J 1/6W	
R827	24366101	Res.Carbon	100	J 1/6W	
U804 70197360 P C Board Assy.Power Tr					
T R A N S I S T O R S					
Q803	A6867970	Transistor	2SD1405-BL		
Q804	A6867970	Transistor	2SD1405-BL		
R E S I S T O R S					
R841	24366301	Res.Carbon	300	J 1/6W	
R842	24366301	Res.Carbon	300	J 1/6W	
U902 70197361 P C Board Assy.Audio Sub Logic					
I N T E G R A T E D C I R C U I T S					
IC605	B0402325	IC	42C70N8116		
IC701	70119518	IC	LA7090		
IC702	B0325536	IC	TA7361AP		
IC703	70119529	IC	BA7750AL		
IC901	B0379260	IC	TA8626N		
IC902	B0379270	IC	TA8627N		
IC903	70119621	IC	NJM2068S		
IC904	23119262	IC	M5216L		
IC905	B0379250	IC	TA8625N		
IC906	B0358220	IC	TA7772P		
ICF01	70119686	IC	M5201L		
ICF02	70119686	IC	M5201L		
ICF03	B0470522	IC	TC4052BP		
ICF04	B0379640	IC	TA79L009P		
ICF05	70119686	IC	M5201L		
ICF06	70119686	IC	M5201L		
T R A N S I S T O R S					
Q611	A6332430	Transistor	2SC2458-Y		
Q612	A6332430	Transistor	2SC2458-Y		
Q638	A6332430	Transistor	2SC2458-Y		
Q697	A6002040	Transistor	RN1204		
Q698	A6332430	Transistor	2SC2458-Y		
Q699	A6332430	Transistor	2SC2458-Y		
Q704	A6332430	Transistor	2SC2458-Y		
Q705	A6319300	Transistor	2SC1959-Y		
Q706	A6319300	Transistor	2SC1959-Y		
Q707	A6332430	Transistor	2SC2458-Y		
Q708	A6319300	Transistor	2SC1959-Y		
Q709	A6002040	Transistor	RN1204		
Q710	A6325540	Transistor	SC2236-Y		
Q711	A6332430	Transistor	2SC2458-Y		
Q712	A6002040	Transistor	RN1204		
Q713	A6002030	Transistor	RN1203		
Q908	A6332430	Transistor	2SC2458-Y		
Q910	A6002040	Transistor	RN1204		
Q911	A6332430	Transistor	2SC2458-Y		
Q912	A6012020	Transistor	RN2202		
Q913	A6012020	Transistor	RN2202		
Q914	A6332430	Transistor	2SC2458-Y		
Q915	A6002040	Transistor	RN1204		

LOCATION NUMBER	PART NUMBER	DESCRIPTION
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Q916	A6332430	Transistor 2SC2458-Y
Q922	A6534430	Transistor 2SA1048-Y
Q923	A6332430	Transistor 2SC2458-Y
Q924	A6534430	Transistor 2SA1048-Y
Q925	A6002020	Transistor RN1202
Q926	A6325540	Transistor SC2238-Y
Q927	A6002020	Transistor RN1202
Q928	A6534125	Transistor 2SA1020-Y
Q929	A6332430	Transistor 2SC2458-Y
Q930	A6534430	Transistor 2SA1048-Y
Q931	A6332430	Transistor 2SC2458-Y
Q932	A6002040	Transistor RN1204
Q933	A6002030	Transistor RN1203
Q934	A6002030	Transistor RN1203
Q935	A6002030	Transistor RN1203
Q936	A6002040	Transistor RN1204
Q937	A6002040	Transistor RN1204
QF11	A6002040	Transistor RN1204
QF12	A6002040	Transistor RN1204
QF13	A6002040	Transistor RN1204
QF14	A6002040	Transistor RN1204
QF15	A6002040	Transistor RN1204
QF16	A6002040	Transistor RN1204
QF17	A6002040	Transistor RN1204
QF19	A6342200	Transistor 2SC2878A
QF20	A6342200	Transistor 2SC2878A
QF21	A6012020	Transistor RN2202
QF22	A6002040	Transistor RN1204
QF23	A6002040	Transistor RN1204
QF24	A6332430	Transistor 2SC2458-Y
QK01	A6002030	Transistor RN1203
QK02	A6002030	Transistor RN1203
QK03	A6342200	Transistor 2SC2878A
QK05	A6332430	Transistor 2SC2458-Y
QK06	A6534430	Transistor 2SA1048-Y
QK07	A6002040	Transistor RN1204
QK08	A6534430	Transistor 2SA1048-Y
QK09	A6012040	Transistor RN2204
QM01	A6002030	Transistor RN1203
QM02	A6002030	Transistor RN1203
QM03	A6342200	Transistor 2SC2878A
QM05	A6332430	Transistor 2SC2458-Y
QM06	A6534430	Transistor 2SA1048-Y
QM07	A6002040	Transistor RN1204
QM08	A6534430	Transistor 2SA1048-Y
QM09	A6012040	Transistor RN2204
QX98	A6332430	Transistor 2SC2458-Y
QX99	A6332430	Transistor 2SC2458-Y

DIODES

D599	A7160570	Diode 1SS176
D601	A7109395	Diode,Zener 05Z 3. 9-Y
D620	A7151500	Diode 1SS201
D701	A7160570	Diode 1SS176
D702	A7160570	Diode 1SS176
D703	A7160570	Diode 1SS176
D704	A7160570	Diode 1SS176
D705	A7160570	Diode 1SS176
D901	A7160570	Diode 1SS176
D902	A7160570	Diode 1SS176
D903	A7160570	Diode 1SS176
D904	A7160570	Diode 1SS176
D905	A7160570	Diode 1SS176
D907	A7160570	Diode 1SS176
D908	A7160570	Diode 1SS176
D910	A7160570	Diode 1SS176
D911	A7151500	Diode 1SS201
D915	A7110017	Diode,Zener 05Z 5. 6-Y
DF01	A7160570	Diode 1SS176
DF03	A7160570	Diode 1SS176
DF04	A7160570	Diode 1SS176
DK01	A7160570	Diode 1SS176
DM01	A7160570	Diode 1SS176
DX98	A7160570	Diode 1SS176
DX99	A7109395	Diode,Zener 05Z 3. 9-Y

COILS

LOCATION NUMBER	PART NUMBER	DESCRIPTION
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L701	23238721	Coil.Peaking TRF4103A1
L702	23221937	Coil.Choke TLN3040
L703	23238721	Coil.Peaking TRF4103A1
L704	23238886	Coil.Peaking TRF4822AE
L901	23237969	Coil.Peaking TRF4331AC
L902	23239835	Coil.Peaking TRF4109AJ
L903	23239835	Coil.Peaking TRF4109AJ
L904	23238732	Coil.Peaking TRF4560AH
L905	23238917	Coil.Peaking TRF4270AC

CAPACITORS

C603	24206478	Cap.Electrolytic 0. 47MF M 50V
C619	24232223	Cap.Ceramic 0. 022MF Z 50V
C620	24201470	Cap.Electrolytic 47MF M 6.3V
C630	24232103	Cap.Ceramic 0. 01MF Z 50V
C631	24436330	Cap.Ceramic 33PF J 50V
C632	24436330	Cap.Ceramic 33PF J 50V
C633	24232103	Cap.Ceramic 0. 01MF Z 50V
C634	24538394	Cap.Plastic 0. 39MF J 50V
C701	24206479	Cap.Electrolytic 4. 7MF M 50V
C702	24212681	Cap.Ceramic 680PF K 50V
C703	24212272	Cap.Ceramic 2700PF K 50V
C704	24591472	Cap.Plastic 4700PF J 50V
C705	24538103	Cap.Plastic 0. 01MF J 50V
C706	24206479	Cap.Electrolytic 4. 7MF M 50V
C707	24203470	Cap.Electrolytic 47MF M 16V
C708	24203100	Cap.Electrolytic 10MF M 16V
C709	24203470	Cap.Electrolytic 47MF M 16V
C711	24201470	Cap.Electrolytic 47MF M 6.3V
C712	24206479	Cap.Electrolytic 4. 7MF M 50V
C713	24538123	Cap.Plastic 0. 012MF J 50V
C714	24591563	Cap.Plastic 0. 053MF J 50V
C715	24206479	Cap.Electrolytic 4. 7MF M 50V
C716	24203470	Cap.Electrolytic 47MF M 16V
C717	24203470	Cap.Electrolytic 47MF M 16V
C718	24203470	Cap.Electrolytic 47MF M 16V
C719	24203470	Cap.Electrolytic 47MF M 16V
C720	24212472	Cap.Ceramic 4700PF K 50V
C721	24212682	Cap.Ceramic 6800PF K 50V
C722	24538563	Cap.Plastic 0. 056MF J 50V
C723	24214221	Cap.Ceramic 220PF K 500V
C724	24538124	Cap.Plastic 0. 12MF J 50V
C725	24538153	Cap.Plastic 0. 015MF J 50V
C726	24538223	Cap.Plastic 0. 022MF J 50V
C727	24538153	Cap.Plastic 0. 015MF J 50V
C728	24538683	Cap.Plastic 0. 068MF J 50V
C729	24202101	Cap.Electrolytic 100MF M 10V
C731	24206229	Cap.Electrolytic 2. 2MF M 50V
C732	24206010	Cap.Electrolytic 1MF M 50V
C733	24203101	Cap.Electrolytic 100MF M 16V
C734	24203470	Cap.Electrolytic 47MF M 16V
C735	24206478	Cap.Electrolytic 0. 47MF M 50V
C736	24206478	Cap.Electrolytic 0. 47MF M 50V
C737	24206010	Cap.Electrolytic 1MF M 50V
C738	24085002	Cap.Electrolytic 2. 2MF M 16V
C739	24538154	Cap.Plastic 0. 15MF J 50V
C740	24538273	Cap.Plastic 0. 027MF J 50V
C741	24206478	Cap.Electrolytic 0. 47MF M 50V
C742	24232103	Cap.Ceramic 0. 01MF Z 50V
C743	24206010	Cap.Electrolytic 1MF M 50V
C744	24202101	Cap.Electrolytic 100MF M 10V
C902	24203100	Cap.Electrolytic 10MF M 16V
C904	24630914	Cap.Electrolytic 330MF M 10V
C905	24436390	Cap.Ceramic 39PF J 50V
C906	24203100	Cap.Electrolytic 10MF M 16V
C907	24203100	Cap.Electrolytic 10MF M 16V
C908	24203100	Cap.Electrolytic 10MF M 16V
C909	24630917	Cap.Electrolytic 100MF M 25V
C910	24474103	Cap.Ceramic 0. 01MF N 50V
C911	24630914	Cap.Electrolytic 330MF M 10V
C913	24201470	Cap.Electrolytic 47MF M 6.3V
C914	24202330	Cap.Electrolytic 33MF M 10V
C915	24212222	Cap.Ceramic 2200PF K 50V
C917	24630914	Cap.Electrolytic 330MF M 10V
C918	24474103	Cap.Ceramic 0. 01MF N 50V
C919	24630917	Cap.Electrolytic 100MF M 25V

LOCATION NUMBER	P A R T NUMBER	DESCRIPTION			
RX06	24366103	Res. Carbon	10K	J 1/6W	
RX07	24366103	Res. Carbon	10K	J 1/6W	
RX08	24366103	Res. Carbon	10K	J 1/6W	
RX10	24366103	Res. Carbon	10K	J 1/6W	
RX11	24366472	Res. Carbon	4. 7K	J 1/6W	
RX12	24366473	Res. Carbon	47K	J 1/6W	
RX13	24366334	Res. Carbon	330K	J 1/6W	
RX15	24366102	Res. Carbon	1K	J 1/6W	
RX16	24366683	Res. Carbon	68K	J 1/6W	
RX17	24366224	Res. Carbon	220K	J 1/6W	
RX18	24366181	Res. Carbon	180	J 1/6W	
RX19	24366221	Res. Carbon	220	J 1/6W	
RX20	24366102	Res. Carbon	1K	J 1/6W	
RX22	24366333	Res. Carbon	33K	J 1/6W	
RX23	24366103	Res. Carbon	10K	J 1/6W	
RX24	24366103	Res. Carbon	10K	J 1/6W	
RX25	24366201	Res. Carbon	200	J 1/6W	
RX26	24366102	Res. Carbon	1K	J 1/6W	
RX27	24366102	Res. Carbon	1K	J 1/6W	
RX28	24366102	Res. Carbon	1K	J 1/6W	
RX29	24366102	Res. Carbon	1K	J 1/6W	
RX30	24366103	Res. Carbon	10K	J 1/6W	
RX31	24366103	Res. Carbon	10K	J 1/6W	
RX32	24366103	Res. Carbon	10K	J 1/6W	

M I S C E L L A N E O U S

GX01	70113095	FLP. 15FM6
SG01	23145532	Slide Switch. 2C3P
SG03	23145533	Slide Switch. 2C2P
SG04	23145533	Slide Switch. 2C2P
SG05	23145533	Slide Switch. 2C2P
SL01	23145510	Push Switch. 1C1P
SL02	23145510	Push Switch. 1C1P
SL03	23145510	Push Switch. 1C1P
SL04	23145510	Push Switch. 1C1P
SL05	23145510	Push Switch. 1C1P
SL06	23145510	Push Switch. 1C1P
SL09	23145510	Push Switch. 1C1P
SL10	23145510	Push Switch. 1C1P
SL12	23145510	Push Switch. 1C1P
SL13	23145510	Push Switch. 1C1P
SL14	23145510	Push Switch. 1C1P
SL15	23145510	Push Switch. 1C1P
SL16	23145400	Push Switch. 2C2P
SX01	23145510	Push Switch. 1C1P
SX02	23145510	Push Switch. 1C1P
SX03	23145510	Push Switch. 1C1P
SX04	23145510	Push Switch. 1C1P
SX05	23145510	Push Switch. 1C1P
SX06	23145510	Push Switch. 1C1P
SX07	23145510	Push Switch. 1C1P
SX08	23145510	Push Switch. 1C1P
SX09	23145510	Push Switch. 1C1P
SX10	23145510	Push Switch. 1C1P
SX11	23145510	Push Switch. 1C1P
SX12	23145510	Push Switch. 1C1P
SX13	23145510	Push Switch. 1C1P
SX15	23145510	Push Switch. 1C1P
SX16	23145510	Push Switch. 1C1P
SX17	23145510	Push Switch. 1C1P
SX20	23145510	Push Switch. 1C1P
XX01	23153847	Resonator. 4MHz. TCR1014
XX02	23153860	Crystal. 32. 768kHz
ZG01	24000711	Resistor Block. 100Kx6
ZG02	24000705	Resistor Block. 100Kx12

M E C H A N I C A L P A R T S

A101	70812668	Front Panel. DX900
A101	70812681	Front Panel. DX900C
A101A	70391412	Screw. 3x12mm
A101G	70863813	Door Assy
A101Q	70393022	Push Nut
A101T	70862773	Ornament
A101Z	70881087	Bottom (PCM)
A102A	70351746	Spring
A102B	70862673	Stopper

LOCATION NUMBER	P A R T NUMBER	DESCRIPTION
A102C	70881088	Bottom (TV STILL)
A102E	70881089	Bottom (REW)
A102F	70881090	Bottom (PLAY)
A102G	70881091	Bottom (FF)
A102H	70881092	Bottom (STILL)
A102J	70881093	Bottom (STOP)
A102K	70881276	Bottom (TV/VCR)
A104A	70824245	Top Cover
A104C	70391414	Screw. 3x8mm
A105	70863782	Cassette Door
A105A	70351679	Spring
A106	70826431	Knob
A107	70881098	Knob
A108	70881171	Knob
A701	70913750	Case. DX900
A701	70913757	Case. DX900C
A702	70921223	Packing (U)
A703	70921224	Packing (L)
AT01	70108174	Case (Upper)
AT02	70108175	Case (Lower)
AT03	70108176	Case (Battery)
AT04	70108177	Filter
B101	70321854	Lever Assy
B101L	70391342	Screw. 2x4mm
B101M	70351689	Spring
B104	70396193	Washer. FI 2. 6x6x 0. 5mm
B111	70323310	Pinch Roller Assy
B112	70396196	Washer. FI 3. 6x8x 0. 5mm
B113	70396193	Washer. FI 2. 6x6x 0. 5mm
B121	70328319	Tension Lever Assy
B126	70351747	Spring
B127	70325029	Band Brake Assy
B128	23721310	Screw. 3x10mm
B203A	70391157	Screw. 2. 6x5mm
B204A	70391157	Screw. 2. 6x5mm
B209	23723308	Screw. 3x8mm
B210	70391081	Screw. 4x12mm
B231	70321858	Earth Brush Assy
B232	70391345	Screw. 3x3mm
B401G	70351634	Spring
B402	70391368	Screw
B405	70322354	T Slider Sub Assy
B406	70391361	Screw. 2. 6x3mm
B407	70322353	S Guide Roller Assy
B407E	70378598	Screw
B411G	70351635	Spring
B412	70391368	Screw
B416	70391361	Screw. 2. 6x3mm
B417	70353115	O-ring
B418	70353115	O-ring
B420	70322378	T Guide Roller Assy
B420E	70378598	Screw
B501	70368130	Ring Guide Roller (L1)
B501A	70368131	Ring Guide Roller (L2)
B502	70368129	Ring Guide Roller (U)
B503	70396196	Washer. FI 3. 6x8x 0. 5mm
B504	70333198	Loading Ring Gear (A)
B506	70333199	Loading Ring Gear (B)
B507	70368116	Double Cap
B509	70391334	Screw. 3x8mm
B513	70333195	Gear
B515	70333196	Loading Drive Gear
B516	70351676	Spring
B521	70347034	Polislider 4. 1x 6. 5x 0. 50mm
B525	70396193	Washer. FI 2. 6x6x 0. 5mm
B526	70323304	Cam Lever
B527	70368122	Stopper
B535	70351683	Spring
B539	70351631	Spring
B541	70396193	Washer. FI 2. 6x6x 0. 5mm
B542	70363305	Lever
B550	70312205	Loading Drive Assy
B553	70396064	Washer. 5. 0x 2. 1x 0. 5mm
B554	70351641	Spring
B555	70351675	Spring

LOCATION NUMBER	PART NUMBER	DESCRIPTION
V802E	72471081	Screw.3x8mm
V802F	70391081	Screw.4x12mm
VE02	70851562	Shield Cover
VE03	70851563	Shield Cover
VE05A	23772306	Screw. 3x0. 5x6mm
VN01C	72471082	Screw.3x10mm
VV04	70391349	Screw. 2. 6x3mm
W951A	70391049	Screw.3x8mm
WE52A	72471082	Screw.3x10mm
Y101	70941838	Owners Manual.DX900
Y101	70941844	Owners Manual.DX900C
Y102	70942463	Dew Caution Sheet
Y103	70948053	Warranty Card.DX900
Y103	70948233	Warranty Card.DX900C
Y104	70942504	Quick Card(Timer).DX900
Y104A	70942504	Quick Card(Timer).DX900C
Y104B	70942506	Quick Card(Timer).DX900C
Y106	70946065	Safety Instruction.DX900
Y107	23293974	Matching Trans.DX900
Y107	23363475	J-J Cable.DX900C
Y108	23363476	Flat Cable.300 OHM
Y118	23293982	Matching Trans.ADB-AD909F
Y121	70933070	Cover
Y125	23367082	Pin Cable
Y130	70382019	Light Pen
Y140	70148244	Remote Control Unit
ZG01	70320158	LED Bracket
ZG01A	23712306	Screw.3x0.5x6mm
ZT01	23109327	CSB455E 455KHZ-2KHZ-200HM

LOCATION NUMBER	PART NUMBER	DESCRIPTION
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